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THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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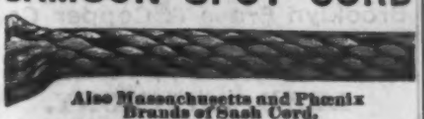

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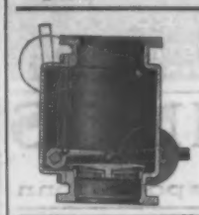

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THE IRON AGE

THURSDAY, FEBRUARY 4, 1904.

Special Machine Tools at the Corliss Shops.

Designs of Two Decades Ago by Mr. Corliss Himself for Economical Production of His Engines.

In the old Corliss shops at Providence, R. I., now occupied as one of the plants of the American & British Mfg. Company, are a number of remarkable machine tools designed by George H. Corliss, inventor of the famous steam engine that bears his name. Mr. Corliss' fundamental patents on a detached valve mechanism were about to expire when, in the early eighties, he shut down his works, excepting for repair work, and set about building a system of tools, by means of which he expected to be able to build engines much cheaper than could the competitors who had been ready to enter the field as soon as the Corliss patents ran out. The tools were designed and built, but Mr. Corliss did not live to see them in complete commercial operation; consequently, they did not have a chance to show their full worth in carrying out plans which he had formulated, but could not leave behind him. Yet even to-day, in spite of the enormous strides which have marked the last 20 years of development of machine tools, including special ones for use in building steam engines, most of the tools that Mr. Corliss designed are still useful adjuncts to an engine plant, and in many instances compare so favorably with modern tools as to indicate that when built they must have represented great advance over the common practice of that time.

These machines are the more remarkable in that they are original, from beginning to end. The designer did not have similar machines to improve upon and adapt to his uses. He had to begin at bedrock and build up his equipment from his own ideas. He is given all the credit for the work; he had his designers and his draftsmen, but they worked out Corliss' ideas. He established a drafting room in his private residence and kept an expert draftsman employed there. It is said of him that he would think out adaptations of mechanical principles while lying in his bed, and would rise in the dead of night to put his ideas upon paper, that there might be no chance for his memory to play tricks over night. He worked with deliberation, as may be realized from the fact that he suspended a great business for two years to devote his entire energies and those of his employees to accomplishing the one result aimed at—to procure a series of machines that would produce a steam engine at a minimum of cost and with a maximum of excellence. He had been mulling over the problem for a long time before he actually set about its solution. For years he had been able to make his own terms with users of steam engines, and he knew the day had come when he must bcome one of many competitors. As already stated, Mr. Corliss did not live to prove how well he wrought in his great plan.

For years these tools were jealously guarded from the eyes of outsiders. It is told by old workmen in the shops that when visitors came to the works, barricades were erected to prevent the curious from approaching too near the special tools. The photographic instrument and sketch book were absolutely barred. In all the 20 years of the existence of these tools this is the first time that

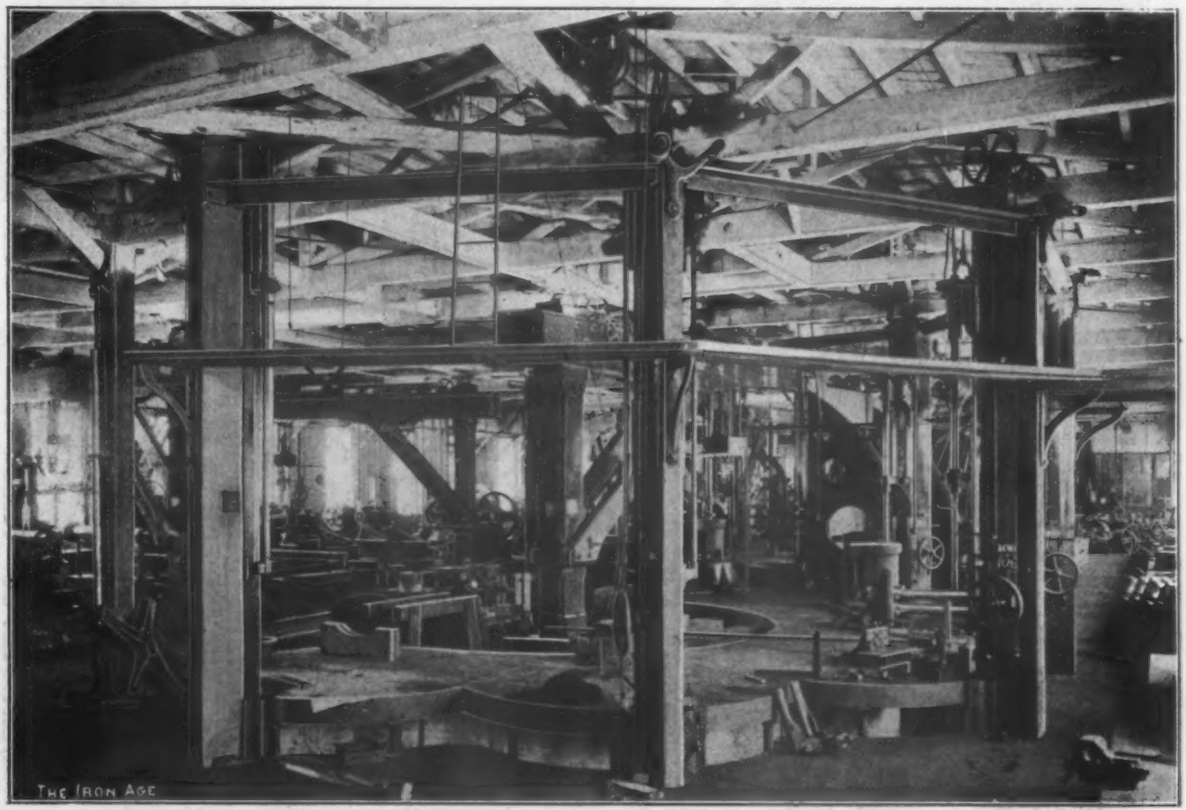


Fig. 1.—General View of Shop, Showing Six Vertical Boring Mills in Foreground.

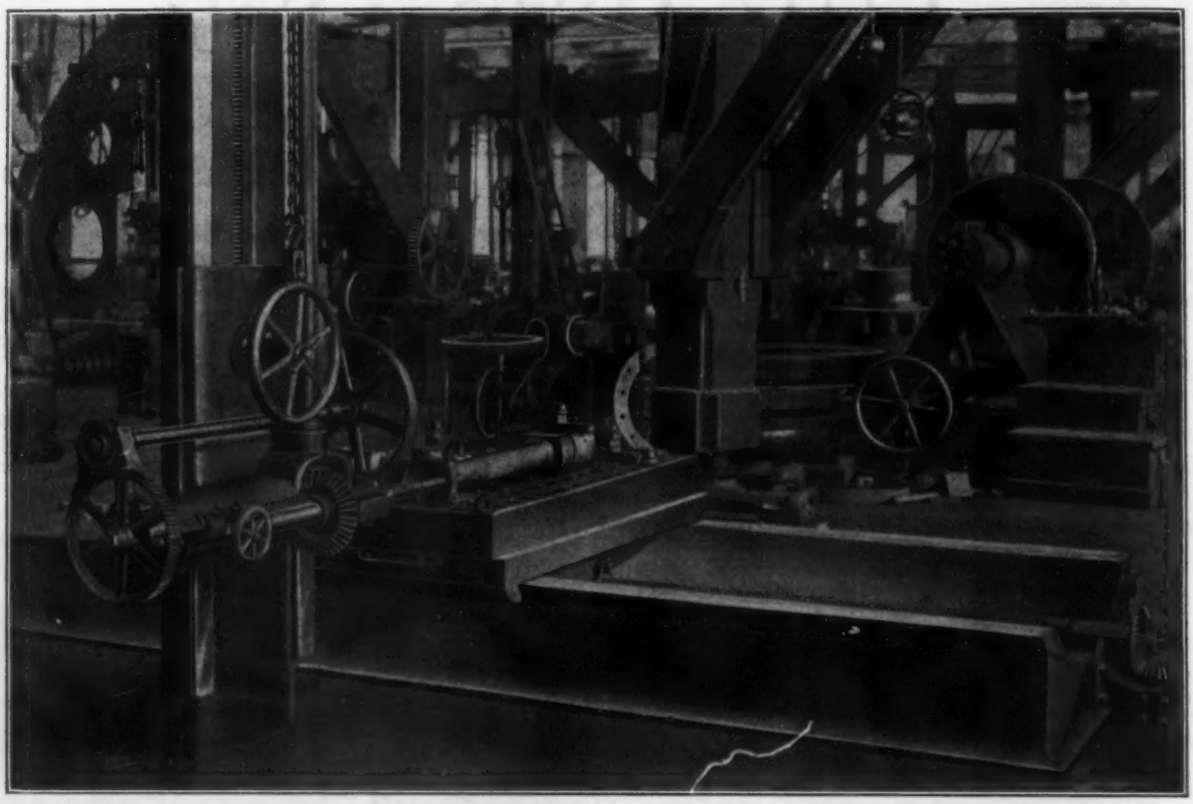


Fig. 2.—Cylinder Machine No. 1, Shown at Special Work.

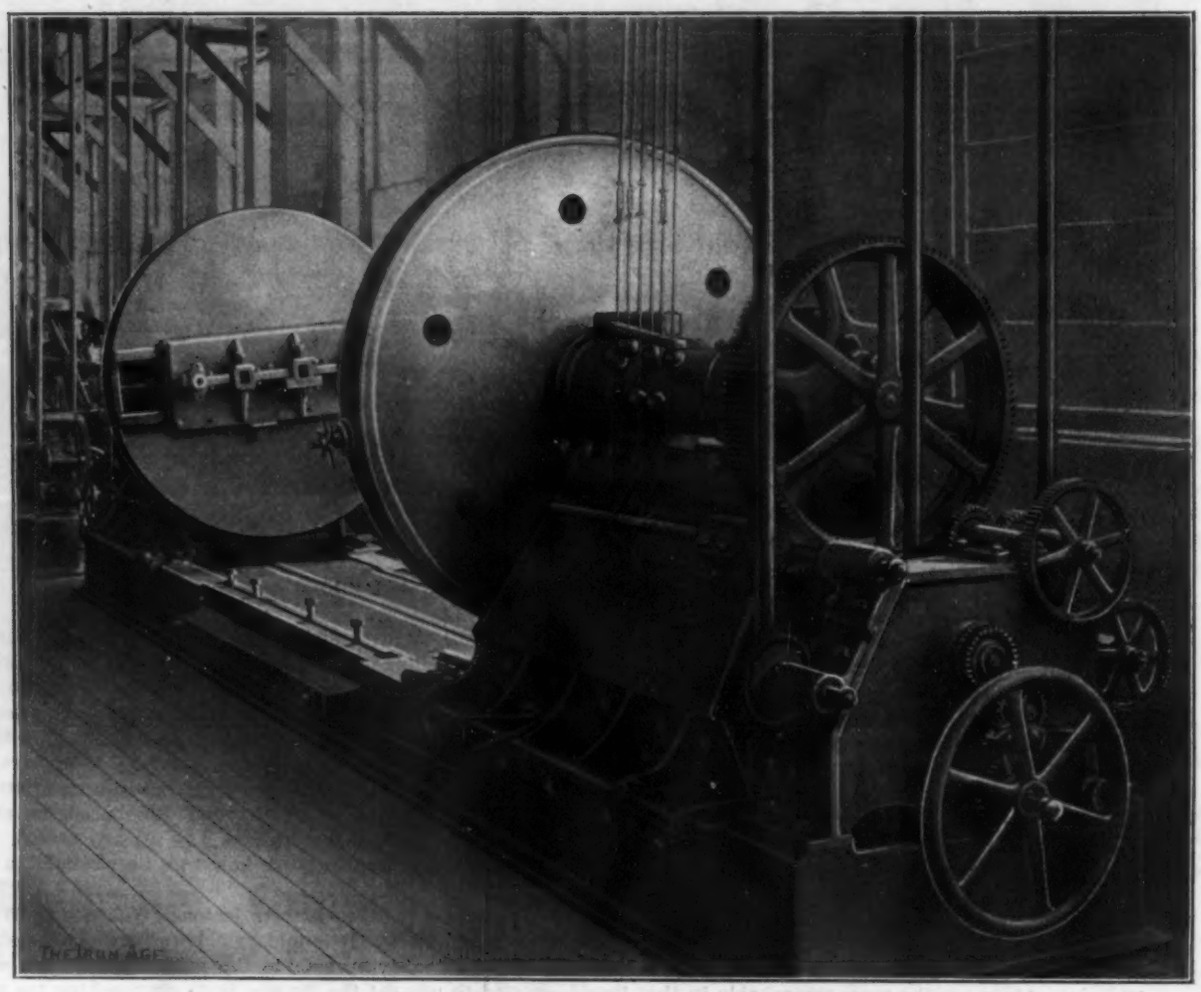


Fig. 3.—Machine No. 2, for Facing, Counterboring and Tapping the Cylinder Ends.

SPECIAL MACHINE TOOLS AT THE CORLISS SHOPS.

any description, even the most trivial, or any illustration, has been permitted in the public prints. *The Iron Age* is now authorized to give to the world the story of the Corliss special tools.

By means of eight machines are accomplished all operations, with one single exception, in working the engine cylinder and engine frame from the rough casting to the finished part. The tools may be considered in two groups. One group, consisting of six machines, Figs. 1 to 9 inclusive, works the cylinder. For convenience of reference they may be designated by the numbers 1 to 6, in the order in which they operate upon the work. Their mechanical functions are as follows:

N. 1. Drills holes for the indicator, for the drips and for the foot studs. Fig. 2.

No. 2. Faces and counterbores the head and crank ends of the cylinder, and drills and taps the holes for the studs. Figs. 3 and 4.

No. 3. Faces, counterbores, drills and taps the steam and exhaust pipe connection flanges on the jacket openings. Fig. 5.

No. 4. Faces off the ports, and drills and taps them to take the studs for the valve hole bonnets. Fig. 6.

No. 5. Five horizontal boring mills of different sizes, for boring cylinders of various diameters. Fig. 7.

No. 6. Vertical boring mill, with six boring bars, for boring the ports. Figs. 1, 8 and 9.

With these machines, every process in working a cylinder is accomplished, with the exception of the single preliminary operation of planing the strips where the feet are to be bolted, these surfaces being necessary in the jig system, by means of which the cylinder is carried through the series of tools and set always in correct alignment.

The second group of tools, Figs. 10-13, performs every operation of working the engine frame, and consists of two tools, the frame milling machine and its "tender," the latter so called in the shop because it is so very much subordinate to the milling machine. There are two of each of these machines. The milling machine, Figs. 10-12, mills out the guides and planes their edges, and also faces up, drills and taps both ends of the frame, one to fit the cylinder, the other to take the crank pedestal. The tender, Fig. 13, completes the process, by milling off, drilling and tapping the governor pad, and drilling the holes for the feet and the holes at the top of the frame. The popularity of the girder engine frame has declined with the coming of the box bed, or "high duty" form, and as the frame milling machine and its tender were designed for working girder frames, these tools are not of as great importance to-day as formerly.

General Features.

The most striking feature of the Corliss shops, in that part occupied by these special tools, is the almost total absence of belting between the overhead shafting and the machines. With the exception of the frame milling machine, every one of these tools is driven by vertical shafts, of steel, 3 inches in diameter. Several of the machines require six shafts, three for each head. Where power is to be transmitted to a machine located away from under the main shafting, or where shafting would be in the way, the drive is from a vertical shaft set in a recess in the brick shop wall, operating a shaft beneath the floor. It is noticeable that these shafts run very smoothly and quietly, after all their years of existence. They have no appreciable vibration, and in the Corliss shops are regarded with much favor as compared to belting. The initial cost was very large, being in this respect quite in harmony with the whole scheme of machine construction undertaken by Mr. Corliss, for no expense was spared to achieve the desired results.

Another striking feature is the utter absence of the common bar shipper. None but a rope shipper can be found in the shops among the older tools. It may be readily seen that with three distinct sources of power transmission to each head of a tool, scarcely any other than rope shippers would be practicable.

Still another general feature pointed out by the men in the shop is that everything in these machines is left handed with respect to what is almost universal practice elsewhere. This, to a machinist unfamiliar with the shop, is at first very confusing.

All these tools have very heavy beds, carriages and other major parts. Their spindles are amply substantial, even for present requirements of modern tools. The gearing, however, is light as compared to that put into similar tools to-day, yet it was considered remarkably heavy and in advance of the times when Mr. Corliss designed it. Under high speed steels worked to their capacity such gearing would probably break down, but neither Mr. Corliss nor any one else, 20 years ago, could have even dreamed of such cutting tools and speeds as are to-day imposing extreme and entirely new conditions upon machines of maximum efficiency. Yet, notwithstanding the great advances of modern machine shop

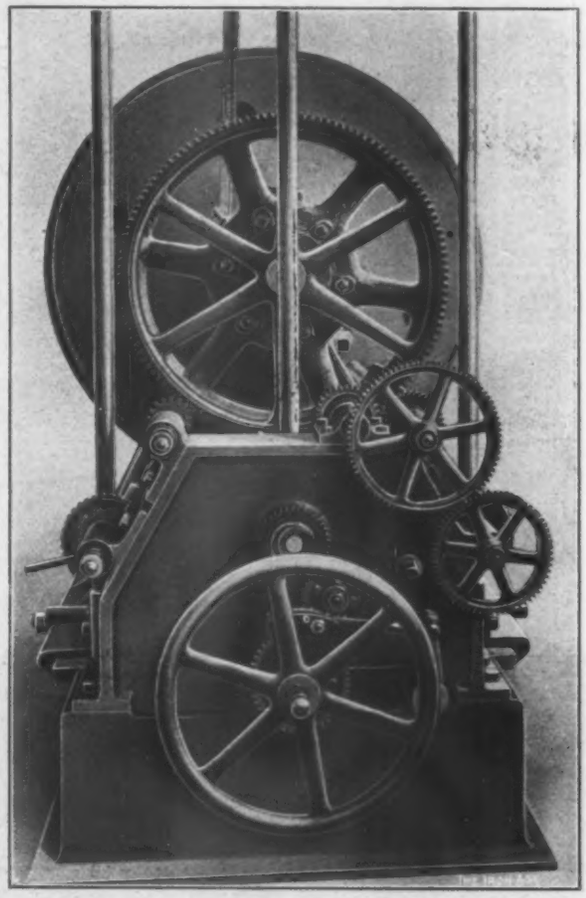


Fig. 4.—Driving Mechanism Detail, Machine No. 2.

SPECIAL TOOLS AT THE CORLISS SHOPS.

practice, it is maintained by men in the Corliss shops, who have had experience in other plants where modern special machines for engine building are employed, that with a continuous stream of work going through the series of tools, so as to afford favorable conditions, results show no such discrepancy as might reasonably be expected in comparison to modern tools for the same purposes. Mr. Corliss planned exceedingly well in effecting a proper balance of production among these tools, for when continuous work is being done by all the tools each machine runs practically continuously. There is little waiting of one machine for another.

The system of handling the work is very complete. A series of jib cranes, each with a lifting capacity of 15 tons, and designed to carry a pneumatic hoist, lifts the work from one machine and swings it into place for attention by the next. The system of jigs is complete, so that no time is lost in setting up work. Every face plate is indexed, where drilling is to be done in a circle, holes being spaced in the circumferential surface to take plugs which hold the face plate in position for drilling, acting against lever clamps, shown in position on the No. 3 cylinder machine, Fig. 5. The indexing is for all sizes of cylinders, and in the frame milling machine, for all sizes of engine frames.

Operations Upon the Cylinder Casting.

The first operation performed by the series of cylinder machines, after the strips for the legs have been planed, is the drilling of the stud holes for the feet, of the drip holes for the head, and of the indicator holes. points. When in position for drilling, the cylinder is held by a rod having a hook fastened into one of the cored holes in the jacket, the other end hooked to the bed and the whole made rigid by means of a turnbuckle. The feed of the table, which is employed only to bring the

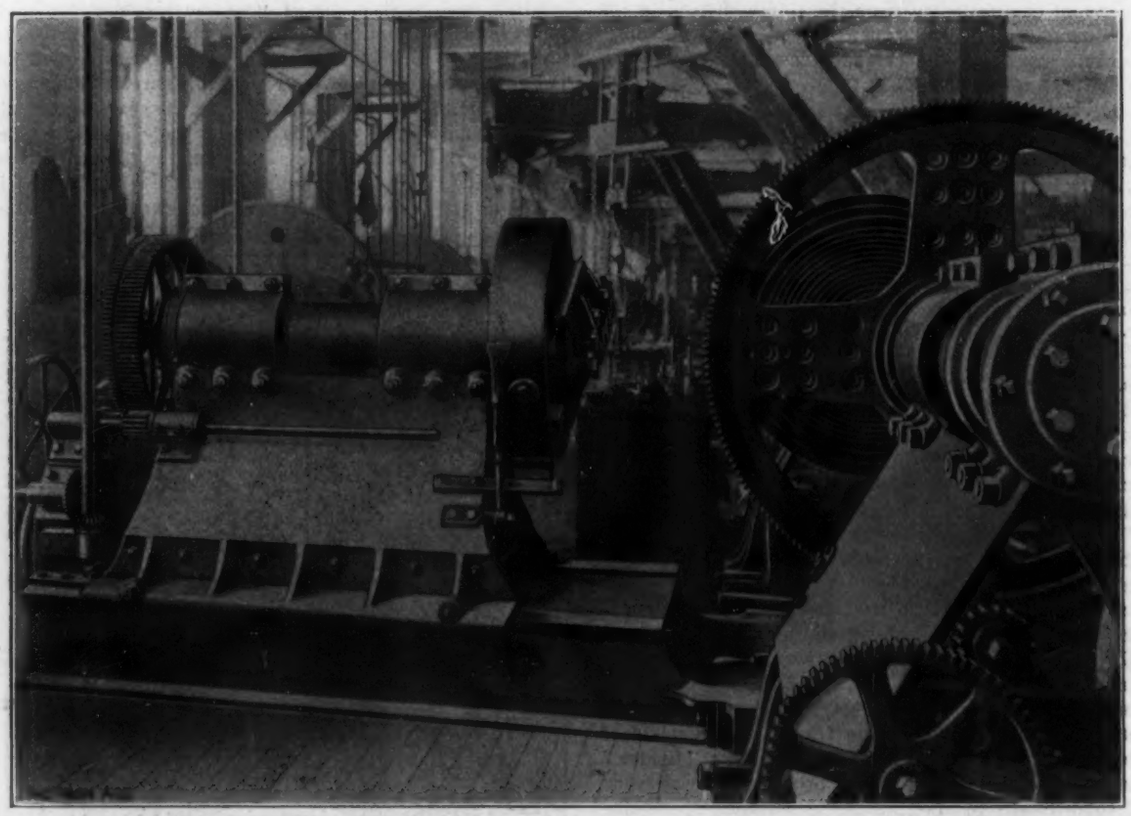


Fig. 5.—No. 3 Machine.—Finishing the Steam and Exhaust Pipe Connection Flanges.

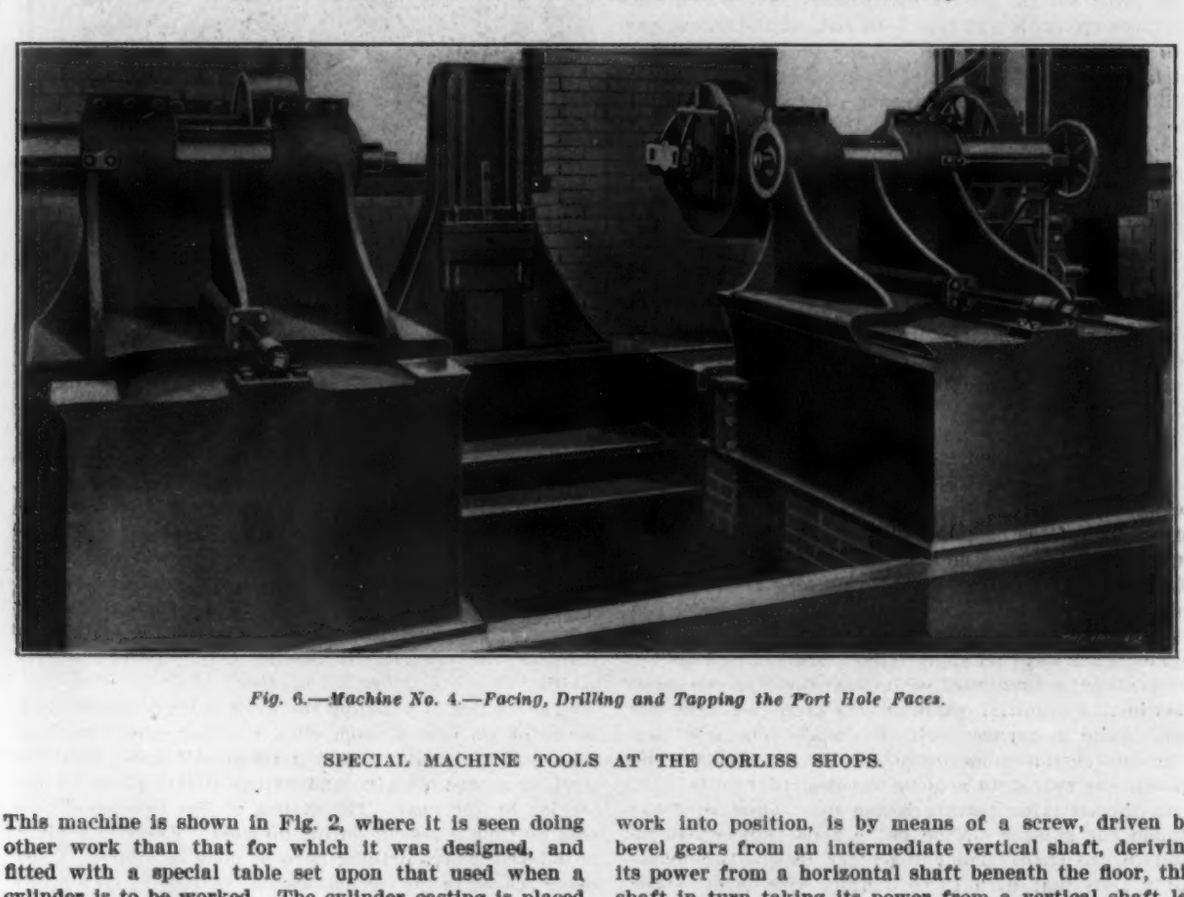


Fig. 6.—Machine No. 4.—Facing, Drilling and Tapping the Port Hole Faces.

SPECIAL MACHINE TOOLS AT THE CORLISS SHOPS.

This machine is shown in Fig. 2, where it is seen doing other work than that for which it was designed, and fitted with a special table set upon that used when a cylinder is to be worked. The cylinder casting is placed lengthwise of the bed on a set of four wheels, two at each side, their axes parallel with the center line of the cylinder. The operator is able to roll the casting into the desired positions to bring the drill to the required work into position, is by means of a screw, driven by bevel gears from an intermediate vertical shaft, deriving its power from a horizontal shaft beneath the floor, this shaft in turn taking its power from a vertical shaft let into the wall of the shop. Power is transmitted to the drill spindle through a vertical shaft and a pair of bevel gears. The head, which is counterweighted, is raised and lowered by means of rack and pinion, con-

trolled by the upper hand wheel seen in the engraving. The feed is by hand, from the lower hand wheel at the front of the post.

The cylinder next goes to No. 2 machine, shown in Figs. 3 and 4, the latter view giving details of the head gearing. This machine counterbores and faces both the head and crank ends of the cylinder, and drills and taps for the cylinder head studs and for the studs at the crank end. The operations performed by this machine differ from the usual practice in that the counterboring is accomplished entirely independently of the boring. This is made possible by the use of a jig, a duplicate of that used in the subsequent boring of the cylinder in the horizontal mill. This is a pedestal jig, bolted to the strips on the cylinder, just as the feet are later bolted to it in the completed machine. There is one of these jigs to each size of cylinder, the hight of the cutting tools always being determined in this system of jigs by the jig itself, and not by the raising or lowering of the cutting tool of the machine. When the cylinder reaches the horizontal boring mill, after undergoing two intermediate processes, a jig of the same hight is bolted to it, and by means of center lines on the bed of the mill exact alignment is obtained.

The mechanical features of Nos. 2, 3 and 4 machines are practically identical, so that to describe one is to describe the three. Taking No. 2 machine, shown in Figs. 3 and 4, as the basis of description, it may be noted that the two ends of the tool are identical, mechanically, and operate independently of one another. Each end has a fixed and a sliding head, as is necessary, because the work is stationary upon the jigs, which are bolted to the table. The sliding head carries the spindle and its bearing and the face plate. The front of the machine faces the shop wall, an arrangement which should be borne in mind in considering the mechanical details.

The tool has three drives to each head. The main drive is at the front of the machine; that is, toward the wall, as seen in the engraving. The power is transmitted through a series of gears to a stud working on a splined shaft, traveling with and meshing into the large gear on the main spindle, which is integral with the face plate. The splined shaft and pinion are best seen in front of the head stock at the left hand of Fig. 5, showing No. 3 machine. In the detailed view of the head, Fig. 4, and also in Fig. 5, it will be noticed that there are two large gears, one on the main spindle, the other on the drill spindle, carried within the main spindle. The vertical shaft at the rear of the machine, to the left in Fig. 4, drives the drilling mechanism in the face plate, through a series of bevel gears. The studs for the intermediate gears between the shaft and the pinion, on the splined shaft at the rear of the machine, are plainly shown in Fig. 3, at the left. Each head is provided with a tapping attachment.

The middle shaft drives the feed of the sliding head.

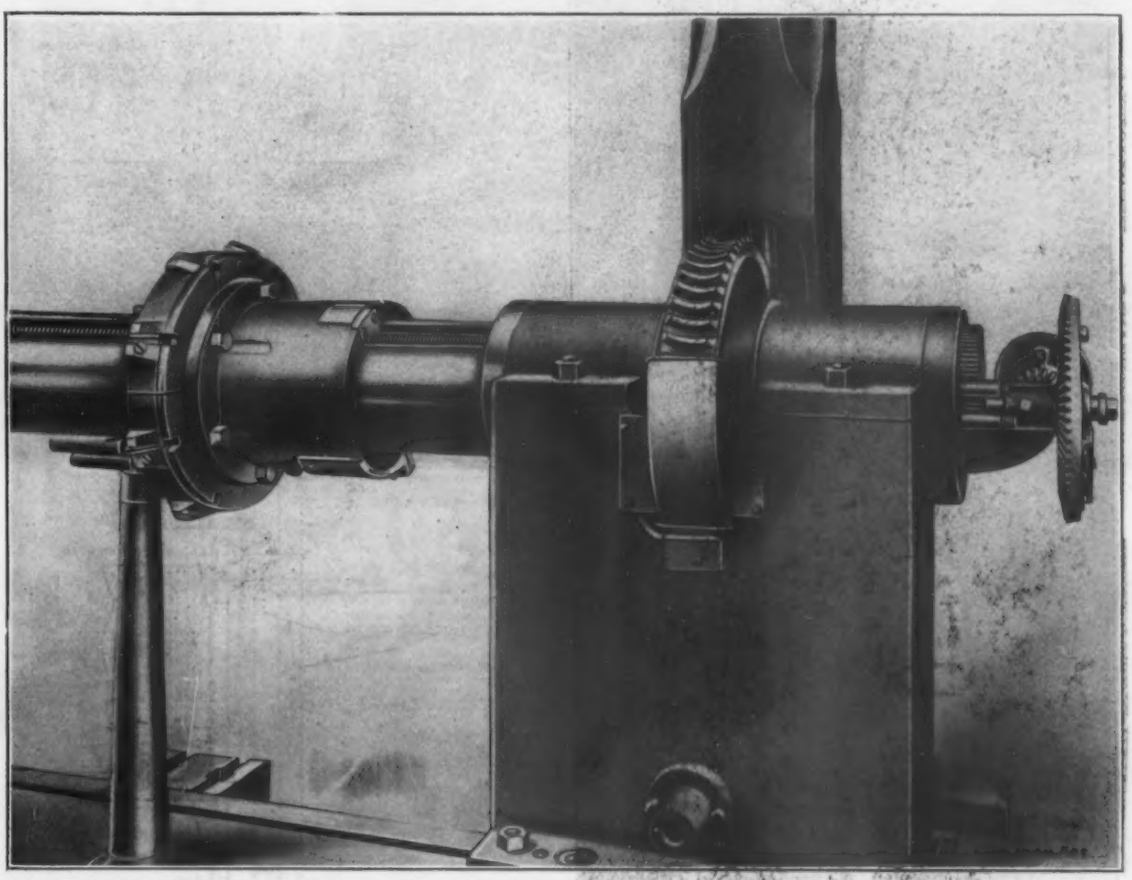


Fig. 7.—Head of One of Five Horizontal Boring Mills for Cylinder Boring.—Stage No. 5.

SPECIAL MACHINE TOOLS AT THE CORLISS SHOPS.

The feed screw passes through both fixed and sliding heads, and is recessed at the head to take a plug with feathered key, which engages either of the two gears or occupies a neutral position between them. When the plug is pulled out the key engages a gear, placing in operation a ratchet feed, arranged to move up as many as five notches at a time, this giving a maximum feed of ⅛ inch. When the plug is pushed in to its extreme position it engages a gear for the quick return. When in its intermediate position the power feed is released and the mechanism may be worked by the hand wheel. The cross feed is accomplished in the face plate by means of a star wheel, seen at the periphery of the face plate in Fig. 3. The drilling and tapping attachment on the face plate is operated by hand. Each face plate is indexed, as are also those of others of the special tools.

The cylinder, counterbored and with ends faced, drilled and tapped, is next taken to No. 3 machine, shown in Fig. 5, where the steam and exhaust connection flanges on the jacket are faced, counterbored, drilled and tapped. The work is supported upon trunnions, centered by the

counterbored ends of the cylinder. The stepped cone face plate, seen between the spokes of the large gear at the right of Fig. 5, takes the open end of the cylinder, while the crank end is carried by a bushing, fitting the counterbored hole. The Corliss cylinder is cast with only one open end, therein differing from the Wheelock and other patterns. There is a step on the cone for each size of cylinder, and a bushing for each. The cylinder is held fixed in position while the work is going on, the trunnions being locked. The work is turned upon the trunnions, as required, by means of a crank through a train of gears to that on the periphery of the face plate, thus bringing opposite flanges successively into working position, facing the cutter head at the left of Fig. 5.

The final process, before replacing the cylinder on a pedestal jig for the horizontal boring mill, is the facing of ports and the drilling and tapping for the studs for the valve hole bonnets. This is accomplished in No. 4 machine, seen in Fig. 6. The cylinder is held upon the trunnion centers by bushings, which fit opposite pipe connection flanges in the jacket, placing the casting in such a position that the axial center line of the cylinder may rotate in a vertical plane at right angles to the line of trunnion centers. During the working operations the cylinder is held against the upright support, seen at the rear of the line of centers of the machine proper. The trunnions are mounted upon deep beds and have a travel toward and from the work by means of screws operated by cranks. This machine differs from Nos. 2 and 3 machines in that it has no ratchet feed device, no longitudinal feed being required for its purposes.

The cylinder is next bored out on one of the horizontal mills, details of the construction of which are shown in Fig. 7. A glimpse of one of these machines is afforded in Fig. 1, at the extreme left hand of the picture, where the mechanism at the top of the column may be indistinctly seen. The feature of this tool is its unusual feed. A screw is let into the boring bar, as shown in Fig. 7, extending full length of the bar to a collar on its outward end. The screw passes through the bearing and thrust collar and terminates in a fixed gear, which rests against the collar, at the right of Fig. 7. This gear meshes into a fixed pinion on a stud projecting from the center of the thrust collar. On the same stud is a bevel gear, which acts as a stationary rack, held by a bevel pinion that is locked by a set screw through the bearing supporting the short pulley shaft upon which the bevel pinion is mounted. When the set screw is released and a belt is thrown onto the pulley a quick return is secured for the cutter head through the bevel gears. A finer feed may be secured through a pair of intermediate gears, between that on the feed screw and that on the center stud. Studs to take the intermediate gears may

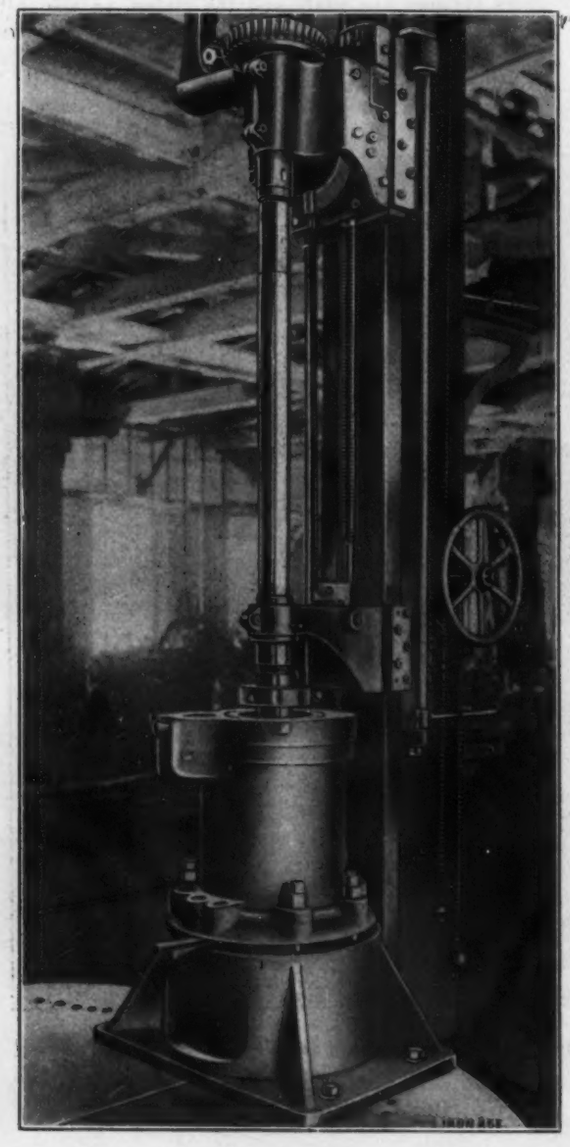


Fig. 8.—One of the Vertical Boring Mills, Machine No. 6.

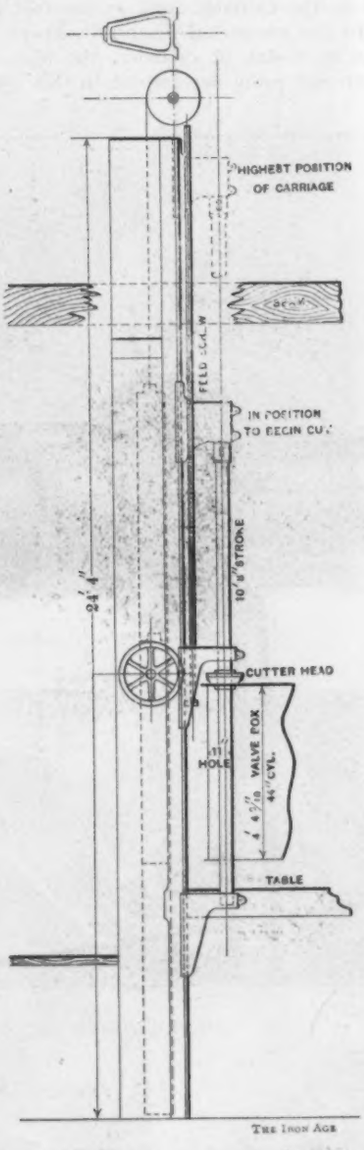


Fig. 9.—Outline Detail of One Vertical Port Boring Mill.

SPECIAL MACHINE TOOLS AT THE CORLISS SHOPS.

be seen in Fig. 7. The boring bar is driven from a worm on the vertical shaft, passing up through the post to the overhead drive.

The final process is the boring of the ports in the large vertical boring mill; a remarkable machine, a general view of which is shown in Fig. 1. The bed is a massive and extensive affair, in the general form of a the post, the lever oscillating the vertical rod, which, in turn, actuates a lever seen at the top of the head, opening or closing the split nut. The quick return is by hand, by means of a rack and pinion inside the post, operated by the hand wheel at the right of the column in Fig. 8. The head is counterbalanced.

This machine having finished its work of boring out

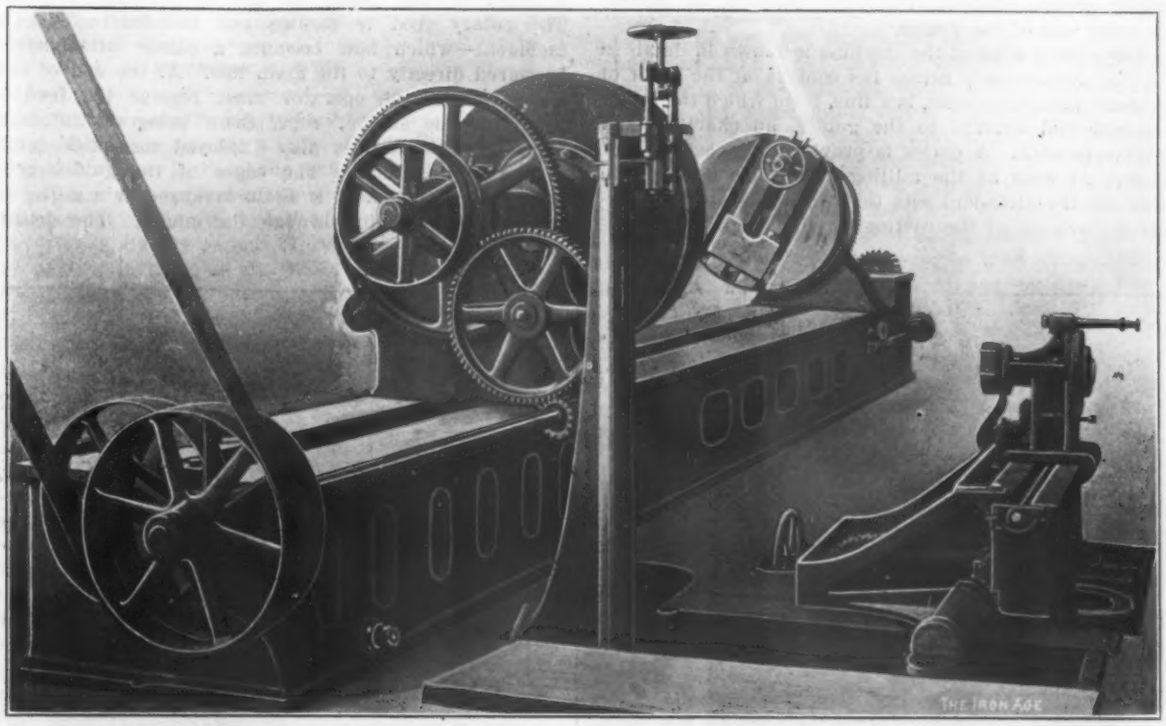


Fig. 10.—The Girder Frame Milling Machine, with "Tender."

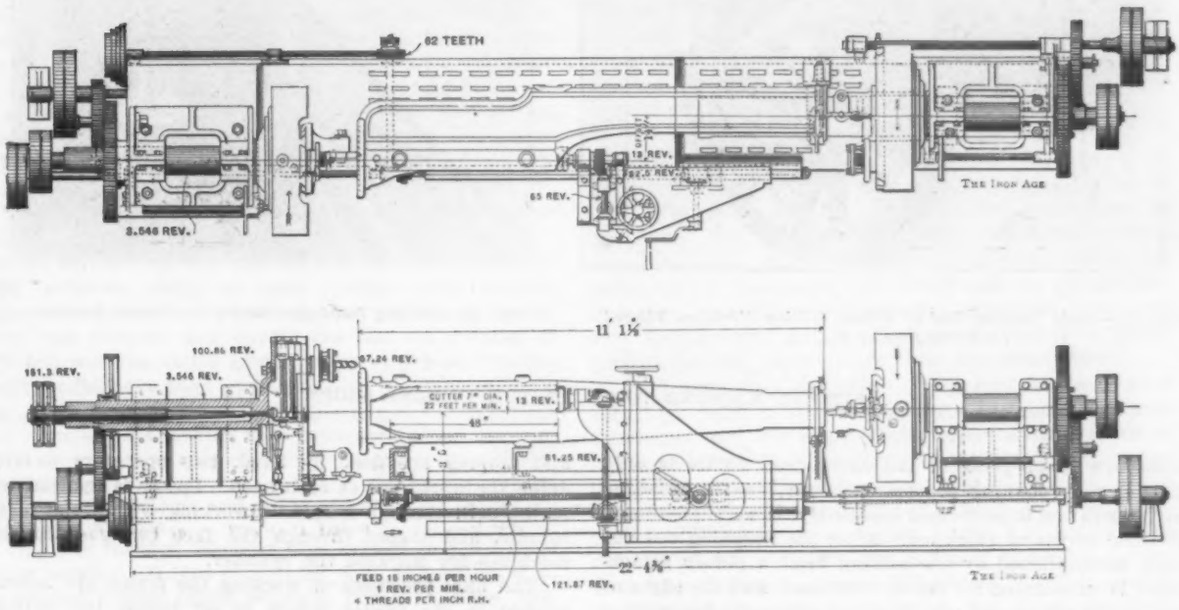


Fig. 11.—Plan and Elevation of Frame Milling Machine with Casting in Place.

SPECIAL MACHINE TOOLS AT THE CORLISS SHOPS.

half circle, with six semicircular lobes or protrusions, like scallops, on its outer circumference. At each lobe is a boring post sustaining a boring bar and its mechanism, as shown in Fig. 8 and 9. Each of the six mills is independent of the others, only the bed being in common. The drive of each is from a vertical shaft, carrying a worm that meshes into a worm gear on the spindle. The feed is from a worm on the countershaft, which drives a worm gear on the feed screw. A split nut, working on the screw at the top of the head, is thrown in and out by the operator by means of a lever near the base of the valve ports, the cylinder is completed, ready for transfer to the erecting floor.

Machining the Girder Frame.

A general view of the frame milling machine is given in Fig. 10; line drawings are reproduced in Fig. 11, showing a casting set to undergo the several operations. Fig. 12 shows in detail the head mechanism, viewed from the distant end as seen in Fig. 10. This machine mills the guides, planes their edges, faces up, drills and taps both ends, the three operations going on simultaneously part of the time.

Each end of the frame is fitted with a jig, securely clamped into position before the casting is placed in the machine. These jigs practically automatically give the necessary alignment to the casting. The cylinder end of the machine—that is, the head which works the cylinder end of the frame—is fixed. The other head is adjustable, both longitudinally and transversely, as is necessary in working various sizes of frames. The guide side of the casting always occupies the same position, no matter what the size of the frame.

The milling head of the machine is shown in detail in Fig. 13. Horizontally across the column, at the hight of the main machine centers, is a line, from which the cutter is raised and lowered to the guides, an exactly equal distance to each. A cutter is provided for each size of frame. As soon as the milling cutter has been set in operation the attendant sets the two heads at work facing off the ends of the casting, so that the three operations are in progress at the same time. This is only during the roughing process, however, for in finishing each operation is performed separately, so as to avoid any possible effects of vibration. After the roughing out has been accomplished by the milling head a planer attachment is substituted for the milling head, and the edges of the guides are planed off. The last process is the drilling and tapping of the ends, for which work the cylinder end face plate of the machine is indexed. A plate jig is provided for the drilling of the holes on the crank pedestal end. The holes are tapped by means of the usual tapping attachment.

The frame milling machine is a simple one, mechanically. Unlike the others of these special tools, it is belt driven, having three principal drives, one for the main spindle of each head, the third for the milling attachment, whose belt is at the cylinder end of the machine, as shown at the right of Fig. 12. Two other drives are provided for the drilling attachments, one at each head, as seen at the left of Fig. 12.

The feed and drive of the milling attachment are very similar to those of the common engine lathe. The drive is by means of a splined shaft from the pulley at the lower right hand of Fig. 12. The feed screw is operated from a back shaft, turned by a small, stepped cone pulley, driven by belt from a larger stepped cone on the main drive shaft at the cylinder end head, Fig. 12. From the back shaft the feed screw is driven through worm gearing, a cross shaft and a pair of bevel gears. When the planer head is used and greater speed of traverse is required, the main feed belt is transferred to a larger driving pulley on the countershaft overhead. The rotary feed is thrown out and the milling attachment—which now becomes a planer attachment—is geared directly to the main line. At the end of each planer stroke the operator must reverse the feed by means of the shipper rope, there being no automatic reverse. This feed is also employed for quick return of the milling head. The edges of the guides being planed, the attachment is again arranged as a miller for taking finishing cuts through the guides. The drilling and tapping are done by hand, two operators usually doing the work, one at each head. Power is transmitted to the drill through a spindle working within the main spindle, and thence through the face plate, as in the machines for working the cylinder.

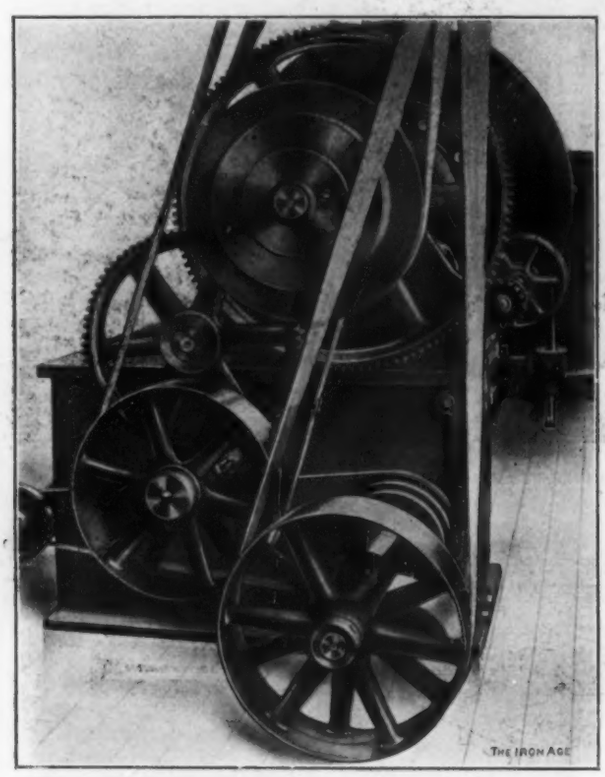


Fig. 12.—Main Driving End of Frame Milling Machine, Viewed from the Left of Fig. 11.

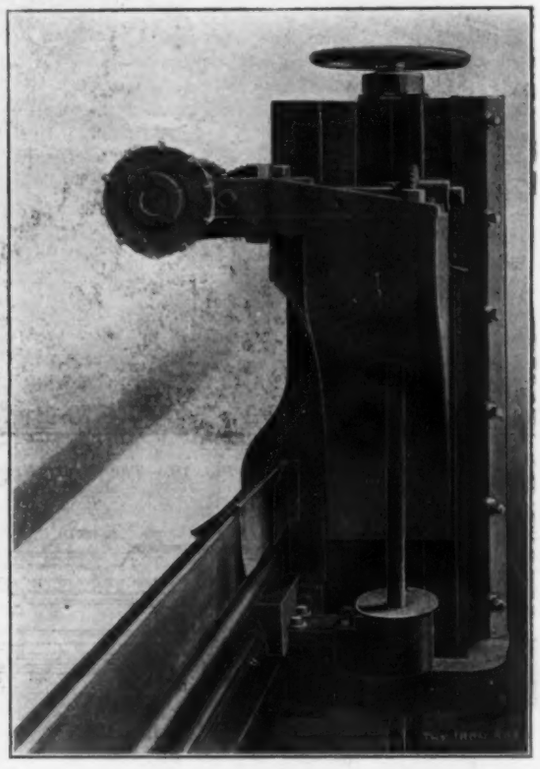


Fig. 13.—Milling Head for Guides on Frame Machine.

SPECIAL MACHINE TOOLS AT THE CORLISS SHOPS.

The final processes of working the frame are accomplished in the tender, which is set beside the milling machine, as shown at the right in Fig. 10. The bed is lifted from the milling machine, with jigs still in place, and laid upon the tender plate, which is set into the floor. The frame is set to center line. The regulator pad, to take the governor mechanism, is to be milled off, drilled and tapped, and the holes for the feet and those at the top of the frame are to be drilled. The milling attachment is similar in its mechanical construction to a rotary planer. The drive is from a vertical shaft, set in the shop wall behind the milling machine, through shafting beneath the floor. The same succession of shafting and bevel gears imparts power to the vertical drill, which is a part of the same machine. A jig is provided for drilling and tapping the pad. The drilling attachment, with its two spindles, drills the holes for the feet and also those at the top of the frame. The Corliss girder

frame is made with the top and bottom identical in form, so that each casting is useful in either a right hand or a left hand engine.

The operations performed by the tender complete the work on the frame, which is then ready to take its place when the engine is assembled.

Conditions Which Surround the Iron Producer in the United States and Great Britain Compared.—II.

BY GEORGE H. HULL.

Warrants in the United States.

So much for the practical effect of the British warrant system. How is it in the United States? Would it not pay us to accumulate large stocks of iron when it can be made at low prices, to sell when it will bring high prices? When, during periods of dullness and low prices in the past, with three to six weeks' stock on hand, we were organizing associations to restrict production, was it not a mistake? Would it not have been wiser in 1895 to 1898, when Bessemer iron was selling at $9 to $10 in Pennsylvania and foundry iron at $6 to $7 in Alabama, to have turned out all the iron it was possible to produce, piled it up and sold it at $18 to $25 in 1899 to 1902? It will not do for us to say, "How could we have anticipated such an advance?" We had only to look at prices and stocks in the light of 10 and 50 years, as our British friends always do, to have calculated upon it with almost perfect certainty. Five times within 60 years the British iron dealers have piled up stocks of iron equal to seven months' production or more, at low prices, and sold it at high prices. Five times the American iron dealers have had the same opportunity and failed to improve it. Five times the British iron producers have reaped the benefit of these high prices on current product, and five times the American producers have thrown it away by protecting the consumers.

There is an impression among many that to manufacture pig iron, pile it up, pay storage and interest on it and carry it during the long, dull period of many years for an advance is a ruinous business, and so it might be for any one with inadequate means, who might be forced to sell before the ultimate advance came; but if this were done by any one or any element having ample capital and a fixed purpose to carry the iron until the advance occurred, it would be a very different matter.

To illustrate, we will suppose that a furnace company in Alabama, making 100 tons of iron a day at a cost of, say, $6 per ton, had kept in blast from 1890 to 1899, inclusive, piling up their product, and carrying same at an expense of 50 cents per ton per annum for interest and storage, and during the last six months of 1899 had sold the entire accumulation at $12 per ton, the result would have been as follows:

Cost of making 328,500 tons, at $6 per ton	$1,971,000
Cost of storage and interest, at 50 cents per ton per year	739,125
Total outlay	$2,710,125
Total yield, 328,500 tons, sold at $12 per ton	3,942,000
Net profit remaining	1,231,875

Has any furnace company ever existed in the United States making 100 tons of iron per day, and selling it at the current market prices as made, who could show anything like such a profit over a period of nine years? And yet we have figured the selling price at $12 per ton only, whereas the market price rose to $20 per ton. If sold at, say, $18, the net profits would have been $3,202,875.

Now, if we transfer this illustration to Bessemer iron in Pennsylvania and Ohio, which cost, say, $9 per ton to produce, 66 cents per ton per annum to carry, and was sold at $18 (the market price went to $25), we would have the following result:

Cost of making 328,500 tons, at $9 per ton	$2,956,500
Cost of storage and interest, at 66 cents per ton per year	975,645
Total outlay	$3,932,145
Total yield of 328,500 tons, at $18 per ton	5,913,000
Net profit remaining	1,980,835

David Sinton of Cincinnati, who was counted the wealthiest man in Ohio in his time, made his great fortune by carrying pig iron from eight to ten years.

These illustrations are given as a partial explanation of why iron making in Great Britain has been so much more profitable than iron making in America, for, as a matter of fact, the illustrations give in substance what the iron makers and dealers have jointly done in Great Britain five times in the last 60 years.

Let us apply this illustration to the entire furnace interest of the United States for the 1890-1899 period. We were producing and consuming in 1890, in round numbers, 9,000,000 tons per annum; in 1897 we were producing and consuming about the same amount, but during the interim many of the furnaces went out of blast, and the production and consumption fell at times to a 6,000,000, 7,000,000 and 8,000,000 rate. Now, if all the furnaces which were running in 1890 had been kept in blast until 1899, turning out about 9,000,000 tons per annum, and the consumption had remained what it was, we would have accumulated in 1891 a surplus of about 1,000,000 tons; in the year 1893, about 2,000,000 tons; in 1894, about 2,500,000 tons; in 1896, about 500,000 tons, aggregating a total during the nine years of about 6,000,000 tons. For illustration, we will suppose this iron cost $9 per ton to produce, that the interest and storage amounted to 66 cents per ton per annum, and that it was carried until the middle of 1899. The result would have been as follows:

Cost of making 6,000,000 tons, at $9 per ton	$54,000,000
Cost of storage and interest, at 66 cents per ton per year	22,440,000
Total outlay	$76,440,000
Total yield of 6,000,000 tons sold at $18 per ton	108,000,000
Net profit remaining	31,560,000

Did we do anything to encourage these results? No; on the contrary, we held meetings to restrict production, and through all other legitimate means strove to prevent this increase of wealth and to prevent this additional revenue to the iron makers and dealers of the United States. With a warrant system, supplemented by exchange sales, patronized by all the producers as in Great Britain, every efficient and well located furnace in the United States might have been kept in blast during the 1890-1899 period, and, by storing and carrying its product, have paid its owners vastly more than has ever been realized by any furnace in this country in producing a like amount of iron.

The delusions which result from looking at the iron business in the light of a month or a year are many. Each time that pig iron has experienced several years of low prices in the United States there has come a general belief that the price of iron would never again reach abnormally high figures. If one attempted to combat this belief, all his arguments were swept aside by the declaration that "conditions are different now from what they ever were before," but the high prices have come again, notwithstanding, and always from the same cause.

Each time that the price of pig iron has reached a very high point in this country there has come a general conviction that the price would never again drop to as low a point as it did before, the reasons assigned for this belief being that "the actual cost of production had increased so greatly that this enhanced cost would sustain future prices on a higher level," but prices have dropped as low, nevertheless; not only to as low a level as before, but even lower. "Enhanced cost" is simply the sympathetic advance in labor, ore, limestore, fuel, freights, royalty, &c. The same conditions which carry iron down carry these down also. All go abnormally low as a result of their having gone abnormally high: "Extremes beget each other."

During the long years of depression which follow a boom the market price of iron is continuously made by the poor furnace companies, not by the rich ones. If the producers were all rich and could and would hold their product until the consumers needed it, or if we had some outside element to do the same thing, it might be different; but without a warrant system, supplemented by exchange sales, there are always some poor furnace companies, and they force sales when they need money, whether the consumers are ready to buy or not;

to do this they must reduce prices until it becomes an inducement for some one to buy in advance of his needs. These forced sales make the market all through the dull years. The rich furnace companies must meet these low prices or hold what they make. What they actually do is to meet them with the expectation that when the needy ones have "forced themselves to the wall" the rich furnaces will then be able to control prices; but this theory of the "survival of the fittest" develops more weak ones each year. Some, which were strong at the start, gradually become weak, and so there are always enough weak ones to keep prices down during the entire dull period. Sometimes conditions become so desperate that various means are devised for restricting production, but nothing avails. The distress continues, and furnace after furnace drops out of the race until there comes another general revival of business. What is the result? The capacity to produce iron is reduced to a minimum just when the country needs iron most, just on the eve of another increase of 100 per cent. in the demand for it. Then follows the period of abnormally high prices, which it is equally beyond the power of the rich furnace companies to control. Those who have been long in the iron business know the evil effect of booms, and when these great advances are threatened they make a heroic effort to prevent prices from going too high by selling all they expect to make for six months or a year ahead; but this has no effect except to cause a short delay in the inevitable advance, for after the producers have sold all they expect to make for a year, and the consumers find out they have only bought about half as much as they will need, there follows a scramble to get what cannot be had, and prices go up to abnormal figures just as certainly as if no effort had been made to prevent it. These high prices cause many of the old furnaces which had "forced themselves to the wall" to be revived and new ones to be built. Thus the expected means of getting control of the market, after the weak furnaces have ruined themselves, brings about the conditions which create more competitors for the rich producers to struggle with during the next period of depression. The "survival of the fittest" policy is a boomerang. It is expected to reduce competition, but it is the most prolific cause of increasing it. A hundred promoters might go to work in dull times with the object of raising money to build new or revive old furnaces and they would have small success; but let the price of iron go up from 100 to 300 per cent. and furnaces spring up on all sides as if by magic. Eight times since 1825 have these delusions obtained control; eight times they have proven to be utterly groundless.

The British iron masters and dealers are totally unable to understand why the American iron masters and dealers have not adopted the warrant system. A Glasgow gentleman, who was interested in iron in both countries, said that if he had known the disadvantages, risks and losses the iron maker suffered from in America, owing to the absence of a warant system, he would not have invested a single £5 note in the business. Another gentleman, in discussing the advantages of the warrant system, said, in effect, that it could all be summed up in a few words. In the United States, at the end of a very long season of depression, your iron districts are dotted all over with abandoned furnace stacks—"monuments of lost fortunes," some of them "monuments of several lost fortunes," and it is doubtful if all the money made by the successful furnaces of the United States in 50 years, would amount to one-half as much as all the money lost by the unsuccessful ones, whereas the money made by the successful furnaces in Great Britain, for the same period, would amount to several times as much as all the money lost by the unsuccessful ones.

The past we cannot change, but it is our best instructor. If the iron producers will but study and understand the lessons that it imparts and adjust the business of marketing iron to the natural laws of iron production, they will create a great automatic force to do their bidding.

Is it not true that whenever any commodity has been introduced to exchange dealings, those dealings have done away with the very low prices and very high prices which that commodity had previously attained?

Do not the low prices of iron in the United States stop many furnaces, and the high prices stop many constructive projects, both of which, at normal prices, might have proceeded without interruption?

Is it not true that in this country, without a warrant system, supplemented by exchange sales, the most insignificant stock will carry prices down to abnormally low figures, and keep them down, from five to seven years out of every ten?

The business of iron manufacturing in the United States has made more rapid advances than in any country in the world. The business of marketing iron is no farther advanced than it was in Great Britain 60 years ago.

How can we expect any improvement in the future unless we improve conditions affecting the future?

If we are to improve conditions, what safer plan can be pursued than to adopt a system which in Great Britain during all these 60 years has been so successful that those who make use of it unitedly approve of it and seek no other?

If we have no warrant system, supplemented by exchange sales, in this country, iron will again go down to $6 in Alabama and $9 in Pennsylvania. If we have such a system there is no reason why it should go down to these absurdly low prices. There is no reason why exchange sales will not do for iron what it has done for every other commodity which has been introduced to exchange dealings. When iron went down to $6 in Alabama and $9 in Pennsylvania it did not yield enough to pay royalty to the land owner, interest to the furnace owner, and yielded only a bare subsistence to the laborer. This was because there was but one buyer for iron. If we had two buyers, the dealer and consumer, one buying all he needed and the other needing all he could buy, prices would never have sunk to such ridiculous figures. No one can study this subject and escape these conclusions. Probably $8 to $9 in Alabama and $12 to $15 in Pennsylvania is as low as these irons would have gone at that period, if there had been two buyers instead of one.

The extraordinary fluctuations and deplorable conditions narrated in the foregoing pages have occurred eight times within 75 years, and they will keep on occurring just as long as the conditions which brought them about continue to exist. There is no unecrtainty about this. They have occurred now so often and so regularly that many writers have been led to attempt to explain them on the supposition that they have resulted from some planetary influence on the human mind, analogous to the effect that the moon has upon the ocean's tide. They have occurred so often that there was absolutely no excuse for the country not having prepared itself for the enormous demand which came between the close of 1898 and the opening of 1903.

The late Hon. Abram S. Hewitt, in a paper read before the American Institute of Mining Engineers in September, 1890, predicted that this country would require 14,800,000 gross tons of iron in 1900. This was not a figment of his imagination but the result of a mathematical calculation based on the actual increase of consumption during preceding years. For 40 years Mr. Hewitt's predictions relating to consumption have been more than verified; just as this one was.

The following is from Mr. Hewitt's address referred to above:

"So far as we are concerned, then, the question is substantially whether this country can nearly double its production within the next ten years without so seriously increasing the present cost of iron as to restrict the consumption and arrest the rate of progress at which the world is now moving forward."

Mr. Edward Atkinson has recently predicted that the demand for iron in the United States will be at the rate of 40,000,000 tons per annum between 1900 and 1913. This prediction, like those made by Mr. Hewitt, is based upon a mathematical calculation of the progressive increase of the past. The demand will not increase gradually, but will increase suddenly, as it always has. Does

not every thinking man know that if we were to accumulate a reserve stock of 10,000,000 tons in the United States before that date it would all be consumed during the first year of prosperity, and does he not know if such a stock is not accumulated we shall have a repetition of the same woeful experiences which the iron business has gone through eight times within the last 75 years?

We cannot have the very high prices without the very low prices. The farther the pendulum swings to the right the farther it will swing to the left. Let us not deceive ourselves with the hope that the great combinations will be able to prevent prices from going down. In 1900, when prices of the seven important shapes of iron and steel reached an average of 70 per cent, above the low prices of 1897, the greatest combination in the world made a vigorous effort to prevent prices going higher, but, notwithstanding it held to these figures manfully itself, the outside market went up to 124 per cent. and 140 per cent. above the prices of 1897. The great combinations will be just as powerless to prevent prices going down. The nature of the iron business is such that it will always go abnormally high and abnormally low, until we adopt some practical business method of relieving the consumers' market of the temporary surplus production which hammers prices down and, by the same method, collect a large enough reserve to supply the increased demand of prosperous periods, until this increase can be met by additional furnace construction.

There is no danger of accumulating during a dull period more than will be consumed during the period of prosperity which follows. The largest reserve stock ever accumulated in the United States by the merchant furnaces was about 1,000,000 tons, equal to but a few weeks' consumption. If the United States had held, at the close of 1897, a reserve stock of four years' production it would all have been consumed in the six years which followed, together with a current annual production of 9,000,000 tons. Think of it; restricting production, with a reserve stock of 1,000,000 tons of iron, on the eve of a period of prosperity which required an extra supply of 36,000,000 tons.

A reserve stock of 5,000,000 tons carried in the United States by the warrant system, would not have prevented a reasonable advance in the price of iron during the five years from 1898 to 1903, but it would have prevented an abnormal advance in its price. It would have prevented the abnormal advance in its cost; it would have prevented the abnormal increase in furnace capacity.

Every man connected with the manufacture of iron and steel in the civilized world has learned to respect the predictions and opinions of the late Hon. Abram S. Hewitt. In a letter to the editor of the *North American Review*, dated July 5, 1899, this great authority wrote as follows:

"It is not for the interest of the public, nor of the manufacturer, nor of the consumer, that the price of pig iron should fluctuate to the extent of 100 per cent. in a single year. Steadiness is only obtainable when sufficient stocks of pig iron for a consumption of at least three to six months exist. The necessity for a larger supply is probably greater in the case of pig iron than of any other commodity."

The Reese-Hammond Fire Brick Company.—The Westmoreland Savings & Trust Company, receivers for the Reese-Hammond Fire Brick Company of Bolivar, have filed an inventory of the assets of the four concerns controlled by the Reese-Hammond interests. The statement shows that the total assets, real estate and personal property are valued at $915,609.59. The liabilities are not given, but it is said they are less than the assets, and it is believed creditors will be paid in full. We are advised that the assets, as stated above, comprise the real and personal property of the four companies in the hands of the receiver at the appraised values of the receiver, which are claimed to be below the cost price and the real value. The figures do not include, however, the bills and accounts receivable of the four concerns, which will increase the assets by about $200,000. There are also assets of two other fire brick concerns, owned by the Reese-Hammond Fire Brick Company, that are not in the hands of receivers, that will be included in the reorganization, amounting to about $250,000 more. The receivers have nothing to do with these latter two concerns, but a supplementary statement will be filed by the receivers showing additional assets of the four companies amounting to about $200,000 more than appears in the statement given above.

Pacific Coast News.

SAN FRANCISCO, January 20, 1904.—The past year was the banner year in imports of foreign iron and steel. The importations of pig iron reached the total of 30,309 tons. Besides this there were about 8000 tons of Eastern to hand during the latter part of the year. The foreign imports were about one-third more than those of 1902. The consumption may be estimated at about 25,000 tons, the largest on record. The stock on hand is very large, about 16,000 tons. The importations of steel billets were 5987 tons. The total value of all foreign importations approached $1,000,000 in value. The importations of foreign pig iron this year will be comparatively small, as supplies will be had from the East, and the stock on hand will be used up.

The drop in Eastern iron last year has had a disastrous effect on the fortune of Seymour R. Church, whose faith in the permanency of values in the pig iron market has proved his undoing. He was caught in the fall in iron and lost $4 or $5 per ton on close to 20,000 tons, some of which is in stock here, while more is on the way. Of this latter 1050 tons came to hand two days ago. The failure involves liabilities of nearly $500,000—to be exact, $465,672.42. The value of the iron on hand and to arrive is nearly $400,000. The failure has had a depressing effect on the market, and if an attempt is made to realize the market will go down to $16 or $17. Mr. Church has been the successor in this market to Jeffries and to Harrison, the former of whom carried the traditions of the business back to the fifties. Mr. Harrison is still in business, but confines himself to the coal trade. Pending the appointment of some one to act as assignee, Herman L. E. Meyer, Jr., son of the head of the firm of Meyer, Wilson & Co., has been appointed as receiver. Some of the iron founders and others who had purchased to arrive are caught and will have to pay $4 to $5 per ton more than they could buy for on the spot.

The Union Iron Works of this city have now fully 3500 men employed in their ship yard and are going on as though there was no such thing as shipbuilding syndicates with their troubles. The manager believes that the lease of the works will hold good in law and that the effort to break it is futile. It is a subject of general congratulation that the failure of the United States Shipbuilding Company has not affected this now flourishing industry, which suffered so much from the recent big strike. In this connection it is well to state that the business of the foundries and machine and boiler shops of San Francisco was never on a better footing than it is at present, and the same is true of the wire and cable and other manufacturing industries in the iron line. As regards the big hardware houses, they have been busily engaged taking stock and going over the results of the year. As a whole the process has been very satisfactory, and the same is true of the trade over the whole coast.

The rains of the past week came just in the nick of time. All the State north of Stanislaus County had been suffering from drought, and people began to look for a general failure of crops all over that district. This meant a great deal to the trade in that important section, as not only did the situation affect the growing crops, but the work of the oil districts and the mines. We are not as yet out of the woods, but later rains will, perhaps, crown the work of those of last Sunday and Monday. Farmers have started plowing where otherwise not an acre would have been seeded, and all, whether agriculturists, fruit men, miners, oil men and merchants, are rejoicing.

J. O. L.

The Manufacture of Welded Pipe.—I.

BY VICTOR BEUTNER, PITTSBURGH, PA.

Ever since pipe has been made the idea has prevailed that the various processes employed were quite secret, and the manufacturers naturally have spread this conception to the best of their ability. The machinery and the methods employed were intrinsically their own, developed on lines quite different in each case; access to the mills is absolutely denied, and the whole thing is shrouded in mystery. Even the few engineers who have ridden the goat are usually retained by the larger tube interests, and are therefore bound to secrecy. As a consequence, there is no literature on this subject. The Encyclopedia Britannica, or the large handbooks on iron and steel like those of Ledebur, Percy or Wedding do not even mention the manufacture of pipe, and a special treatise on the subject does not exist to my knowledge. The manufacture of seamless tube fares somewhat better since the numerous patent papers contain considerable information.

History.

The earliest method of manufacturing tubes was that employed by gunsmiths from the invention of fire arms until the first quarter of the last century. A piece of flat iron is bent around a mandrel, and the overlapping edges are brought to a welding heat, a few inches at a time, and welded by blows of a hammer. For the hand hammer of the earlier smiths a helve or trip hammer was substituted.

When with the introduction of gas and steam the demand for tubes increased greatly, it became necessary to insist on a greater uniformity than could be obtained in hand welding, and in 1824 James Russel passed the hand welded tubes through a set of rolls and over a mandrel, thereby obtaining the proper inside and outside diameter of the tube. James Russel further established the fact that a sufficiently strong joint can be obtained by forcing the ends of the skelp against each other, instead of overlapping them, as had always been done previously. This fact led directly to the introduction of the new methods of butt welding pipe, which are still in use in practically their original form. James Whitehouse, in 1825, took out a patent covering the following process: A piece of skelp of suitable width is bent until the two edges nearly meet. One-half of this bent skelp is inserted in a furnace and brought to welding heat. The cold end is fastened in a suitable manner to the traveling chain of a draw bench. The two halves of a ring shaped die are closed together by a pressure screw; the chain is started and the heated portion of the skelp drawn through the die. The diameter of this die is a trifle smaller than the outside diameter of the skelp, and the pressure exerted is sufficient to close the joint of the skelp by welding the edges together. Then the half welded pipe is reversed, and the other end finished in the same way. The pressure screw used to force the two halves of the die together soon proved far too slow and tongs were used, shaped as shown in Fig. 1, the jaws of which form the

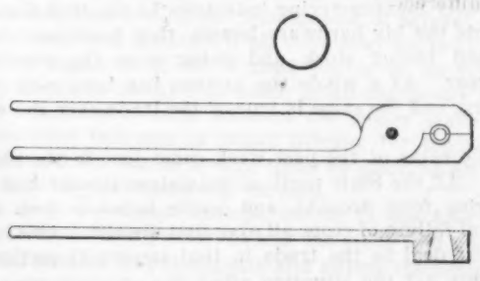


Fig. 1.—The Tong Process.

dies, and can be quickly opened and closed. The draw bench is provided with a steadying rest against which the tongs are rested while the tube is drawn through.

Very soon a most important improvement was made in the manufacture of butt welded pipe. A solid die, usually called a bell, was employed, and it was found possible to bend and weld the skelp in one operation, by first clipping the corners of the skelp, and by employing suitably constructed tongs, which gripped the skelp very firmly, yet were small in diameter and could pass through the opening of the bell, Fig. 2. This method, usually

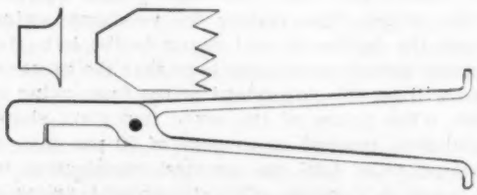


Fig. 2.—The Bell Weld Process.

called the bell weld method, has found a very large field, owing to its simplicity and cheapness. The strength of such butt welded joint is also very remarkable. I have seen 1-inch pipe, made by this method, tested to 1000 pounds per square inch hydrostatic pressure, and the thickness of metal of 1-inch standard pipe is little more than ⅛ inch. The limitations of the bell weld methods are self evident. When either a very great resistance to inside pressure is required, or when it is essential to keep the thickness of metal down, it is impracticable. The skelp of large pipes has the tendency to collapse, instead of filling the bell, and although I have seen 4-inch pipe made successfully, the usual commercial limit for this process is 2 inches, or, at most, 2½ inches. The smaller sizes, say below ⅜ inch, present another obstacle, since the gripping tongs must pass through an opening of the bell, which is too small to allow of their proper strength of construction. In this case, the tong process described above is employed, while in all the other cases the lap weld method must be resorted to.

This method dates back in all its essential features to about 1840, when it appears that both the Russels and a man named Martin Jones took out patents covering it. In this method the skelp, previously bent in a manner that one edge overlaps the other, is heated to a welding heat, and immediately passed through the grooves of rolls and over a mandrel. Through the pressure between the upper roll and mandrel, usually called ball, the two overlapping edges are united, as in Fig. 3.

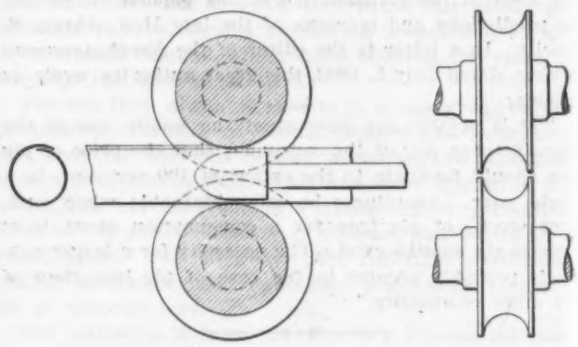


Fig. 3.—The Lap Weld Process.

Although not altogether within the scope of this talk, it might prove interesting to have the most important method of manufacturing seamless tubes discussed briefly. The oldest and simplest method is the rolling or drawing out of a billet, which has been previously pierced by forcing a punch through its center while in a red-hot state. Another method is illustrated by Fig. 4. Through a number of successive operations a flat sheet of metal is cupped, the depth of this cup increasing with each operation. Lastly the bottom is cut off and, if desired, the tube may be finished by drawing. A patent taken out some fifteen years ago provides for the casting of small

ingots with a core of powdered refractory material, which hollow ingot is again finished as above.

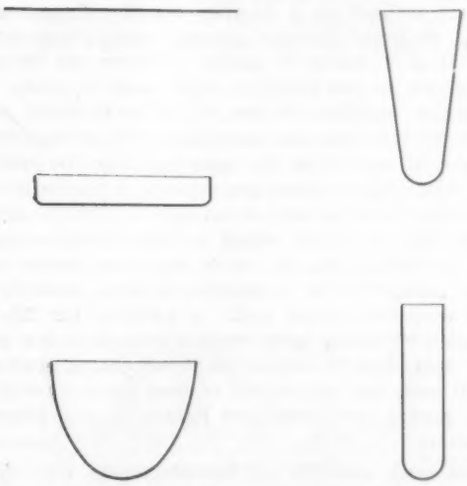


Fig. 4.—The Cupping Process for Seamless Tubes.

Quite a startling innovation, however, was embodied in the principle of diagonal rolling, as covered by a number of patents awarded to the brothers Mannesman in 1885 and 1886. This principle can be carried out in a number of ways of which Fig. 5 and Fig. 6 are representative instances. It can be readily seen from the sketches that the rolls impart a rotary or whirling and a forward motion to the piece. In the arrangement shown in Fig. 5 this forward motion is caused by the inclination of the axes of the conical rolls in relation to each other, while in Fig. 6 the rolled piece is introduced not quite on line with the axes of the mushroom rolls. An altogether satisfactory explanation for the remarkable results of this method is hard to give. It seems that the material instead of flowing in a longitudinal direction, as in the ordinary rolling, has a tendency to flow outwards toward its circumference, owing to the rotary motion, a distinct displacement of the fiber taking place. This fact is shown clearly in Fig. 6, where the resulting tube has a larger diameter than the original billet. The mandrel shown in both cases has nothing to do with the formation of the hole, and only serves to smooth the inside of the tubes.

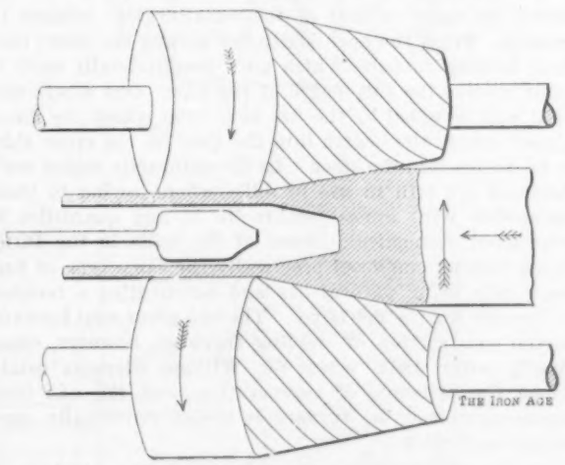


Fig. 5.—The Mannesmann Process.

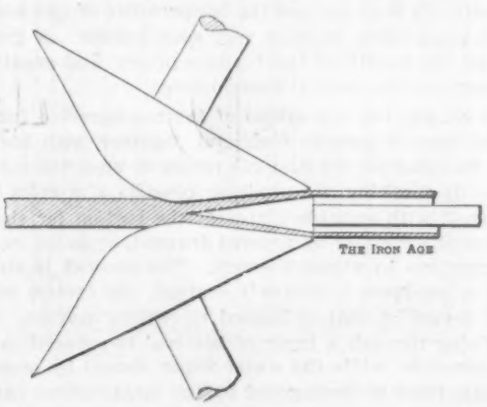


Fig. 6.—The Mannesmann Process.

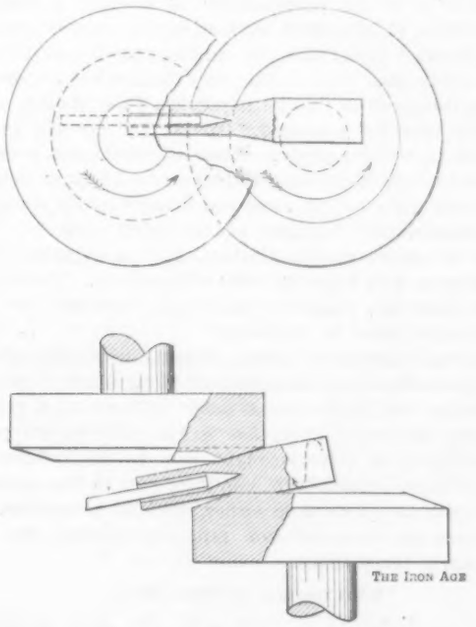


Fig. 7.—The Stiefel Process.

In the Stiefel process, patented in '95 and shown in Fig. 7, a heated billet is passed between the faces of two parallel disks, which impart to it a rotary and a forward motion, forcing it thereby against and over a piercing mandrel. The working faces are shaped in such a manner as to cause a uniform speed of rotation, and thus the parallel longitudinal arrangement of the fibers is not disturbed.

In the Ehrhardt process a piercing bar is forced into a solid billet, the cross section of which corresponds with the area of the tube to be produced. This billet, heated to white heat, is placed in a form, which corresponds to the outer shape of the tube. The difference of the area of this form and of the area of the billet must be equal to the area of the piercing bar. The metal forced from its center flows to the outside, taking up the space between the original billet and the form, which is equal to the amount of material displaced by the piercing bar.

It might not be amiss to say a few words here as to the comparative merits of the seamless drawn and the ordinary welded pipe. The first certainly presents a highly interesting subject from a technical standpoint, and through the ample discussion of the various methods in scientific bodies and the advertising derived from its use for boilers, or other tubular appliances, the seamless tube has gained quite a notoriety. I am prepared, however, to say—although I was not able to procure exact statistical figures—that of all the wrought pipe manufactured to-day 95 per cent., and probably even considerably more, is made by either the butt or lap weld method. The great difference in the cost of manufacture and the fact that although seamless pipe might be better the ordinary welded pipe is amply good enough for all but exceptional cases, are the obvious reasons for this fact.

Skelp.

The strips of wrought iron or steel used in the manufacture of welded pipe are called skelp. Its width is equal to the outside circumference of the desired pipe, plus a trifle for compressing the edges in butt weld, or plus the necessary allowance for a lap in lap welded pipe. The smaller sizes of skelp are rolled in grooves in three high skelp mills, differing little from the ordinary bar mills, the larger sizes in universal mills with two plain horizontal and four vertical rolls, and for the largest size plate mills are used and the rolled product sheared to the proper width.

In the beginning it was thought possible to use only iron skelp for the manufacture of welded pipe—that is, skelp rolled from piled strips of muck bar made by the puddling process. When with the introduction of the Bessemer and open hearth processes steel found a daily growing field, and when the metallurgist became acquainted with its peculiarities, it became a tempting proposition to use steel possessing the proper chemical and physical properties for making pipe, and the late T. J. Bray was one of the very first who successfully solved this problem in the Riverside Tube Works, which at that time he managed. To-day by far the greater portion of welded pipe is made of steel, and even the difficulties which presented themselves in threading the soft basic open hearth steel are being rapidly overcome. A representative analysis of the steel used for skelp ought to show about: Carbon, 0.5; manganese, 0.36; phosphorus, 0.1; sulphur, 0.05; silicon, 0.02. These properties, however, might be materially modified by individual experience or preference.

Generally speaking, steel presents less difficulties in manufacturing than wrought iron, being much "cleaner" to handle, and furnishes a more uniform and reliable product. The only exception is the well known power of resistance of pure wrought iron to the influence of rain or other atmospheric moisture and to the corrosion by the soil, if exposed to either, without protection. In such case the wrought iron pipe will outlast the steel pipe nearly three times.

The Design of Pipe Mills.

In the designing of pipe mills the same principles which govern the design of every steel plant, for that matter every manufacturing plant, must be observed. The product ought to pass through the various machines in a logical manner, as each operation is to be consecutively performed, without ever doubling back on its own track, or interrupting the continuous progress. If the last operation is to be performed with a certain speed, which will determine the output of the mill, the machines preceding ought to perform the work from step to step with greater speed, to provide a safeguard against stopping the whole chain of operations, if one of the initial appliances should be temporarily stopped. The times when pipe mills were put in cheap, tumble down board structures have passed, and the steel frame building, either with brick filler walls or with corrugated sheet covering, has been adopted universally.

Very often a traveling crane commands the total space occupied by the rolling machinery, to be used for changing rolls, or to repair quickly break downs, and if such crane can shorten the delays only one hour per week, it will have paid for itself in incredibly short time. The means for providing light and ventilation must be carefully considered. The work around the furnaces is trying and hot, and even with artificial fan ventilation and in modern mills spell hands must be secured for some of the furnacemen during the warm season. In older mills some of these men only work 15 minutes and rest 30 minutes. The upper end of the building must contain ample storage room for skelp conveniently situated to the charging end of the furnaces, and, indeed, unless a pipe mill is directly connected with skelp mills, which can be operated to suit requirements, this skelp storage ought to be very ample.

It is self evident that in order to obtain the best results a mill must be run as long as possible on one size of pipe, and the changes from one size to the other ought to be made gradually, beginning from the smallest and slowly increasing to the largest size within the capacity of the mill, and then slowly stepping down again, and the storage capacity both for skelp and for finished pipe must be large enough to allow this method of operation quite independent from quantities or sizes for which orders are booked by the sales department. An electric traveling crane, usually running crosswise through the building, and often extending into wings, unloads the skelp, stores it and delivers it to the furnaces. Where the skelp is stored outside or in large sheds provided only for this purpose a locomotive crane has been employed with good success.

In many of the pipe mills built during the last four or five years, the lower end of the mill building proper has been utilized as a location for the threading machines. Such arrangement appears faulty for many reasons. It is a waste of money to cover the threading floor, which is practically a light machine shop, by a steel frame building, 30 feet to the roof chord, strong enough for crane service, and costing $1 per square foot or more. If located in the same building, the operators of the threading machines are exposed to the radiation of the furnaces and hot beds in summer, and to the draught and the cold in winter, which is often severe enough to freeze the lubricating oil. It is, therefore, better to finish the rolled pipe in a separate building suitably connected with the rolling mill. A building for this purpose, built of brick, with wooden trusses and a strong timber floor, only 18 feet to the chord, can be erected for 50 to 60 cents per square foot of floor space covered, and can be heated, ventilated and lighted as any other machine shop.

Since both methods of manufacturing pipe depend upon the successful heating of the skelp to a temperature at which the edges can readily be united or welded, the apparatus to produce this heat—the furnace equipment—occupies a very prominent position in the design of a pipe mill.

The Pipe Welding Furnace.

The development of the pipe welding furnace has been about the same as that of the metallurgical furnace in general. From the open smith fire sprang the short coal fired heating furnace, which grew longitudinally until it could receive the full length of the pipe. One whole side of it was occupied by the fire box, from which the flame played across the hearth into the flues on the other side, to be drawn into the stack. In the anthracite region such furnaces are still in use in mills where, owing to their connection with mines, anthracite in any quantities is considered economical. Some of the mills in the Pittsburgh district employed practically the same type of furnace, only using natural gas and substituting a number of burners for the fire boxes. The one great step forward in the construction of welding furnaces, however, came shortly after 1861, when Sir William Siemens established the principle of regeneration, and the gas fired regenerative welding furnace is to-day universally used in pipe mill work.

Under regeneration, we understand the storing of waste heat of the escaping gases after combustion in the furnace and the utilizing of this stored heat to raise the temperature of gas and air before combustion. This is accomplished by passing the off gases through chambers filled with brick checker work, by which a considerable amount of the heat of these gases is absorbed. After a certain time the operation of the furnace is "reversed," and air and gas passing through the heated chambers absorb the heat of the checker work, the off gases in the meantime heating another set of chambers. This reversal is constantly kept up, and the temperature of gas and air before combustion becomes very soon intense. A greater heat on the hearth of the furnace proper and great fuel economy are the natural consequences.

As shown, the operations of the regenerative furnace depend upon a gaseous fuel, and, together with his furnace, Siemens put the first gas producer upon the market. Generally speaking, the producer consists of a brick-lined iron shell with suitable grates at the bottom for the admission of air either by natural draught, or in all modern constructions by steam blowers. The process is simple. After a producer is properly started, the carbon of the lower layers of coal is burned to carbon dioxide. This CO_2 rising through a layer of hot coal is reduced to carbon monoxide, while the water vapor caused by moisture or steam blast is decomposed by the incandescent carbon, forming carbon monoxide and hydrogen. To prevent the escape of any gas during the cleaning of the fires, a water pan has been introduced, which effectually seals the bottom of the producer, the clinkers and ashes resting in this pan and being removed below the water level.

Based upon these principles a great number of pro-

ducers have been designed, differing only in small features, which are usually protected by patents. The Duff producer is equipped with a grate shaped like the ridge of a roof, the Smythe producer has one inclined grate, and in the Forter design, the blast is introduced through a center tuyere and under a circular inclined grate surface. Mechanical stoking has been attempted in the Talbot-Fraser producer with but indifferent success.

Producers are generally arranged in a row, with convenient provisions for the handling of the coal, which is supplied either by an elevated track, running parallel to the producer platform, or by overhead conveying machinery. The gas is collected in flues either overhead or underground, and distributed to the furnaces. A good producer will gasify 7 tons of coal per day, giving in round numbers 1,000,000 cubic feet of gas. Producer gas consists of about

6 Carbon dioxide,
23 " monoxide,
8 Hydrogen,
3 Methane,
60 Nitrogen,

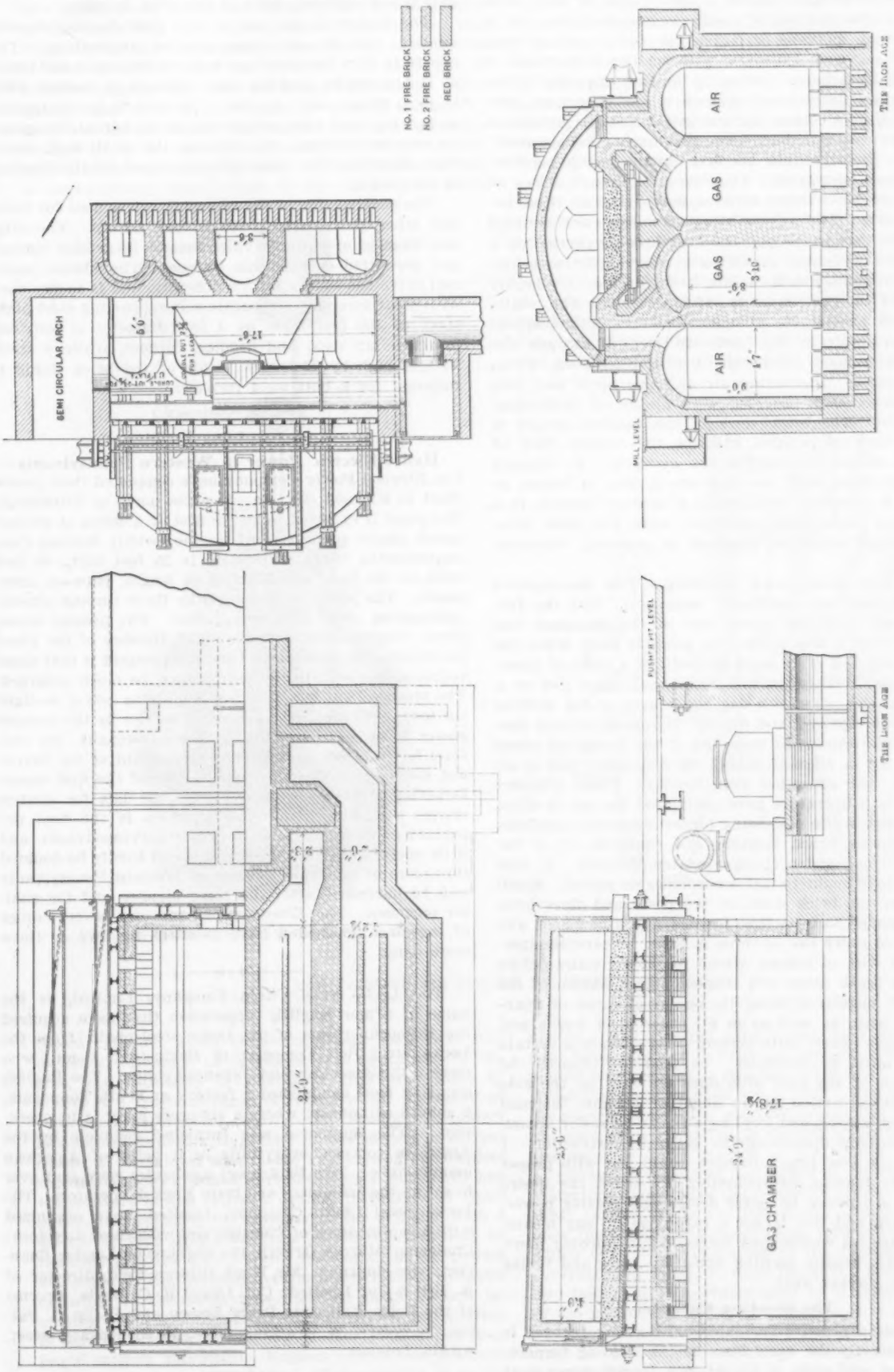


Fig. 8.—Lap Welding Furnace.

and as a fair average 120 B. T. U. per cubic foot might be figured. Usually two producers are provided for one furnace.

In the Pittsburgh district natural gas is used extensively, which shows a much higher calorific value than producer gas, having a heat value of over 1000 B. T. U. Natural gas is mostly composed of from 60 to 70 per cent. methane or marsh gas (CH_4) and of from 20 to 30 per cent. hydrogen, with smaller proportions of other hydrocarbons. Owing to the fact that the hydrocarbons are decomposed even in a moderate heat, precipitating solid carbon, natural gas is directly introduced into the furnace without being previously "regenerated."

Since Siemens built his first furnace many improvements have been made. The engraving, Fig. 8, shows an up to date lap welding furnace, embodying all these improvements. The regenerating chambers are situated below the furnace proper, the hearth being carried on a grill work of beams, providing ample ventilation below. The air chambers each contain 1000 cubic feet of checker work and the gas chambers one-fourth less. The retaining walls around the chambers contain hollow spaces arranged to drain any moisture seeping through the ground to a sump, from which it can be removed. From the chambers alternating air and gas ports lead into the furnace, each provided with means of individual regulation. The brick work of the furnace proper is kept as thin as possible, utilizing the cooling effect of the air outside to preserve the masonry. To support this frail brick work an extensive system of braces or binders is provided, and indeed a modern furnace is a permanent steel frame structure, with fire brick filler walls, which might be repaired, or replaced, whenever required.

The high arched roof, allowing a free development of flame, has been extremely successful. For the furnace proper and the upper part of the chambers and checker work a best grade clay brick is used, while the lower parts and valve seats are built of a brick of somewhat lesser quality, backed by a hard burnt red or a wire cut brick. Twice a day the hearth of the welding furnaces is repaired, and during this operation and during the intermission at noon and at the change of crews the furnace is allowed to cool off somewhat, and is allowed to cool altogether over Sunday. These frequent changes in temperature have prohibited the use of silica brick, which while possessing higher refractory qualities than the clay brick, expands and contracts to a far greater extent under changes of temperature. A well built furnace ought to last a considerable period. Small repairs of the brick work of the ports and flues have to be attended to from time to time, and a new roof will be required every two or three months. A careful superintendent will, of course, attend to these repairs before a serious break down will suspend the operation of the mill, such suspension being the one great cause of financial loss here, as well as in all other steel works and rolling mills where with certain fixed charges a certain tonnage must be produced. In modern furnaces the skew back of the roof arch does not rest on the side walls, but is carried by an angle or channel fastened to the buck staves, and local repairs can be easily accomplished without disturbing the general construction. I do not know how long a furnace would last with proper care. The reasons for rebuilding are either the desire to obtain a furnace of better design and greater power, or the fact, and this is not a rare case by any means, that a careless welder had succeeded in burning down his furnace, usually melting down the ports and fusing the upper checker work.

The Bending Furnace.

In modern practice the lap weld bending furnace is built on exactly the same lines as the welding furnace. In the first cold skelp is heated to a bright cherry heat of about 1500 degrees F. The skelp, after having gone through the bending operations, is immediately charged into the welding furnace, which it enters, owing to unavoidable delays, at from 1000 to 1200 degrees, and there its temperature is raised to 2400 degrees or more, each furnace thus nearly performing the same amount of work. The hearth of the welding furnace is made of silica sand or broken pieces of china and other high grade pottery, thoroughly burned down and fused. It usually slopes ⅝ inch per foot to allow the cinder to run off freely. The hearth of a bending furnace is level and only paved with two rows of fire brick on edge.

The design of the butt or bell weld furnace is very similiar, but of somewhat smaller proportions. The hearth is 12 inches narrower between fire walls and about 30 inches shorter, and the cubic contents of checker work is 15 to 20 per cent. smaller. The hearth is constructed as in a lap weld furnace but usually horizontal, the greater ease in charging and drawing the small skelp more than offsetting the inconvenience caused by the running of the cinder.

The construction of the reversing valves used for these and other Siemens furnaces is well known. The original Siemens or butterfly valve became invariably warped and permitted considerable leakage. The Forter water seal valve has overcome this difficulty, and is to-day used with great success. A separate self supporting steel plate stack of 100 feet hight by 4 feet diameter is provided for each lap weld and bending furnace, while a stack 90 feet high by 42 inches inside of the brick lining is sufficient for a butt weld furnace.

(To be continued.)

Hydro-Electric Power in Western Pennsylvania.—The Ellwood Power Company have completed their power plant at Ellwood city, Pa., 40 miles north of Pittsburgh. The plant is expected to be the first of a series of similar power plants to be erected on the swiftly flowing Connoquenessing River. The dam is 25 feet high, 40 feet wide at the base and 175 feet in length, between abutments. The power is developed by three turbine wheels, aggregating about 1500 horse-power. The present steam power requirements within a short distance of the plant are about 2500 horse-power, and the prospect is that these requirements will, in the near future, be much enlarged. The steam plant, which is now supplying power to light the town, will shortly be put out of service by the cheaper power to be furnished by the power company, the contract having been signed. The large plant of the Standard Engineering Company will be one of the first manufacturing plants to use power from the dam for electric cranes and other requirements. This is the first important plant of the kind in Western Pennsylvania, and if its operation proves successful it can hardly be doubted that more of the rapid streams of Western Pennsylvania will be harnessed after the same manner and for similar purposes. The Ellwood Company own several miles of the river front, and have locations for two or three more dams.

The Locke Steel Chain Company, Limited, is the name of a new English corporation that have acquired the European rights of the Locke steel chain from the Locke Steel Belt Company of Bridgeport, Conn., who reserve the American and Japanese rights. The English company have established a factory at South Tonneham, a suburb of London, where a six-press plant is in operation. The equipment was furnished complete by the American concern, everything in it being of American manufacture. Two Bridgeport mechanics were sent over to set up the machinery and train English operators. The Locke Steel Chain Company, Limited, have organized with a capital stock of £200,000, and with these directors: Chairman, Murray Griffith, the well-known London financier; vice-chairman, Sir Hugh Gilzean Reid, director of R. Hill & Co., Limited; Col. Lionel R. C. Boyle, director of the Beira Railroad; Percy Brown and Philip C. Patton; secretary, W. Watkins, office, 18 Bishopgate street, within, London.

For the fiscal year ending June 30, 1903, the De Beers Consolidated Mines, Limited, the great South African company operating the De Beers, Kimberley, Premier, Bultfontein and Dutvitspean diamond mine, produced 2,475,802 karats of diamonds, valued at £5,241,173. The net earnings were £3,654,979, and the dividends, £2,175,000.

The Perkins Air Cooled Cylinder Gas Engine.

Water cooling of cylinders for internal combustion motors, especially in the smaller sizes, which are commonly the most useful in the rougher classes of service, is a requirement whose abolishment would add greatly to the simplicity and convenience of motors of this class, and would also contribute materially to reduction of costs of maintenance and repairs. The small gas or gasoline engine used for pumping, hoisting, or other special lines of work, as well as for general commercial service in the driving of light machinery, must generally be trusted to the more or less tender mercies of an unskilled attendant, and will most likely be accorded only a comparatively small share of his time. The water cooled cylinder, under these conditions, may be a real nuisance, inasmuch as carelessness in operating the engine, and especially in leaving it after completion of a run, is a frequent cause of frozen water pipes and of consequent expense for repairs. Air cooling of cylinders has been attempted with greater or less success in various cases. It is claimed that in the Perkins engine complete success has been attained in maintaining a sufficiently low temperature of the cylinder casting in engines of small power, by providing the exterior of the cylinder with a system of very deep ribs, from which the heat may be radiated into the air. Perkins engines of larger powers are made in the horizontal form and with water cooled cylinders of the usual type. In the small motors, including the 1½ horse-power size, of which one pattern is here illustrated, air cooling of the cylinder has been found entirely successful. Engines of this size are built in the vertical form, as shown. The operation is on the 4-cycle principle.

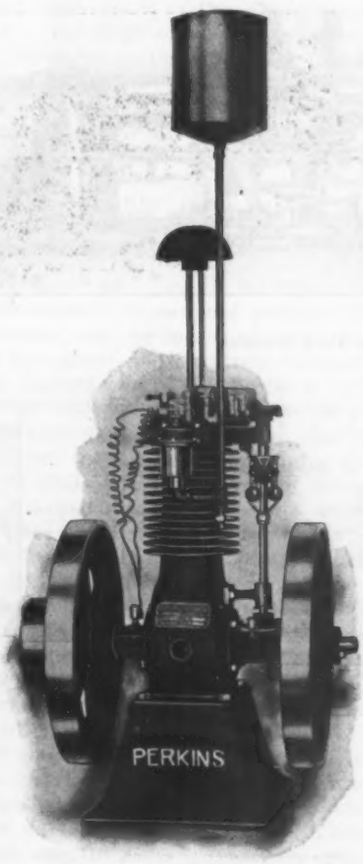


Fig. 1.—Front View of 1½ Horse-Power Engine.

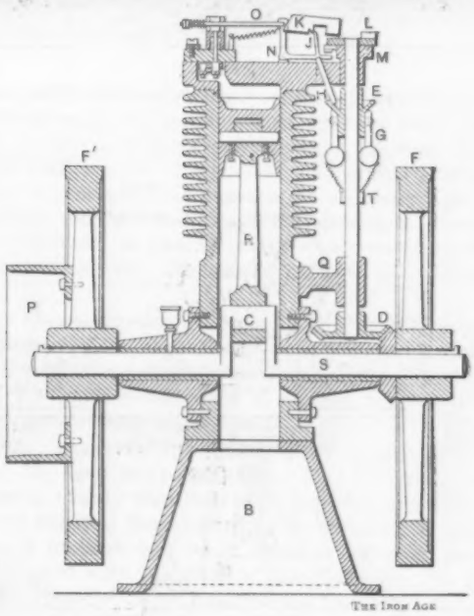


Fig. 2.—Central Section, Showing General Construction.

THE PERKINS AIR COOLED CYLINDER GAS ENGINE.

Fig. 1 shows the 1½ horse-power engine fitted with an elevated tank reservoir for gasoline. The engine is, of course, equally adapted to the use of gas for fuel. Fig. 2 is a vertical central section, from which are evident the general simplicity of the construction and also the operation of the governing and igniting mechanism. The engraving represents the commercial type of the engine, wherein a pulley is fitted to one fly wheel, from which pulley power may be delivered to whatever machinery is to be driven. Among other forms in which the engine is built is included one wherein the base B of Fig. 2 is extended to carry a pump jack, which the engine drives by means of a pinion mounted upon its crank shaft in place of the fly wheel F.

Referring to Fig. 2, the deep flanging of the cylinder is plainly shown. These flanges are 1½ inches deep and offer a large radiating surface, from which the heat may be carried away by the air, whose constant circulation is insured by the fanning action of the fly wheels and other moving parts. The cylinder diameter is 3½ inches, and the stroke is 5 inches. The speed is from 300 to 500 revolutions per minute. The reciprocating parts are all of the simplest possible construction, consistent with efficiency of operation and with proper durability. Bevel gears D drive from the crank shaft S the vertical governor shaft, whose lower end is supported in the bracket bearing Q. A fly ball governor, G, is fitted to this shaft, this type of governor being believed to be the most satisfactory for an engine of this class. Outward and upward motion of the governor balls, under the action of centrifugal force, operates to raise the cone E, which, in Fig. 2, should be shown as a separate piece from the collar to which the governor balls are pivoted. The upper ends of the governor ball arms, working against the under side of the cone, raise the latter, as already indicated. Entering the upper or inner portion of the cone E is the lever 11, pivoted in a manner not shown in the engraving, and controlling the action of the admission device. The governor shaft carries at its top two disks, L and M, carrying upon their upper and lower faces, respectively, cam lugs, which control the operation of the engine. Below the governor is a collar, T, upon the shaft, from which lead two helical springs, whose duty is to steady the action of the governor. Collar T is secured in place by means of a thumb screw, so that its position upon the shaft may be set to give whatever tension of the springs may be found advisable.

The mixer of the engine is made entirely of brass, avoiding all possibility of rusting or corroding. Since the flow of fuel is by gravity, there is no gasoline pump to give trouble. Bearings throughout the engine are brass or brass lined, and are fitted with oil cups at proper points. It is believed that the engine has a

less number of parts and is simpler in its construction and operation than others of its type and class. To give an idea of the smoothness with which these engines may be run, it is stated that a number of them are being regularly used by physicians in operating X-ray apparatus, for which, of course, very uniform speed and steady action are essential. The makers are the Perkins Wind Mill Company, Mishawaka, Ind.

A Sectional Multiple Block Wire Bench.

Although it possibly may not have occurred to some users of wire drawing machinery, yet it will at once be obvious to all that considerable advantage may be derived from the arrangement of wire drawing benches in multiple, such that two or more blocks may be operated from one driving shaft, without any interference one with the other, and yet with considerable economy of floor space and driving appliances. Where single machines are used, each requiring ordinarily a separate drive, and making necessary the placing of an individual countershaft and the use of at least two belts for each machine, how readily a multiple set of bull blocks may be arranged for driving from a single source without sacrificing any of the essentials of convenience, efficiency, &c., offered by the single machine, is evident from the engravings which we present at this time. Fig. 1 reproduces a photograph of a machine with four drums, the whole being in two sections, each carrying two blocks, and one of them also having attached the main driving pulley. By this combination of double sections in connection with the continuous driving shaft there is formed a properly sectional wire bench, which may readily be extended toward the left by the addition of other double sections, up to the limit contemplated by or corresponding to the strength of the shaft at the pulley and the transmitting capacity of the pulley itself and the belt through which the power is derived. In Fig. 2 is reproduced a general drawing of the machine, showing the driving gear and the two drums, with the accompanying mechanism for the first, or driving, section

It will be noted by those familiar with this class of machinery that the multiple wire bench of the illustrations involves in each of its drawing units a complete bull block machine of the single type, yet differing in certain details of construction and operation from usual types of the latter. In the first place, possibly for the first time, successfully, in connection with machinery of this class, pneumatic power is used for actuating the draw out mechanism for use in starting the wire through the die. For each unit of the machine there is supplied an air cylinder, as plainly shown in Fig. 1, and as indicated at A A, Fig. 2. The piston rod leading from the air cylinder is attached to a cross head, B, sliding between suitable guides. This cross head has protruded from its further side, as seen in Fig. 2, a stud upon which turns

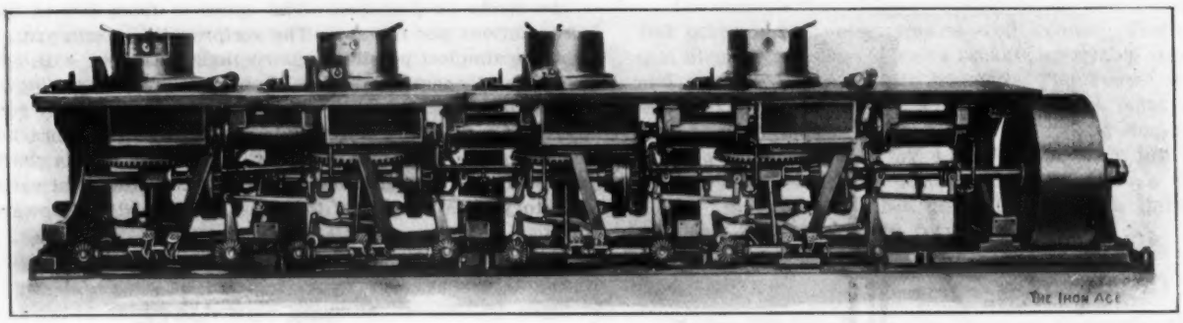


Fig. 1.—Front View of a Two-Section Four-Block Machine.

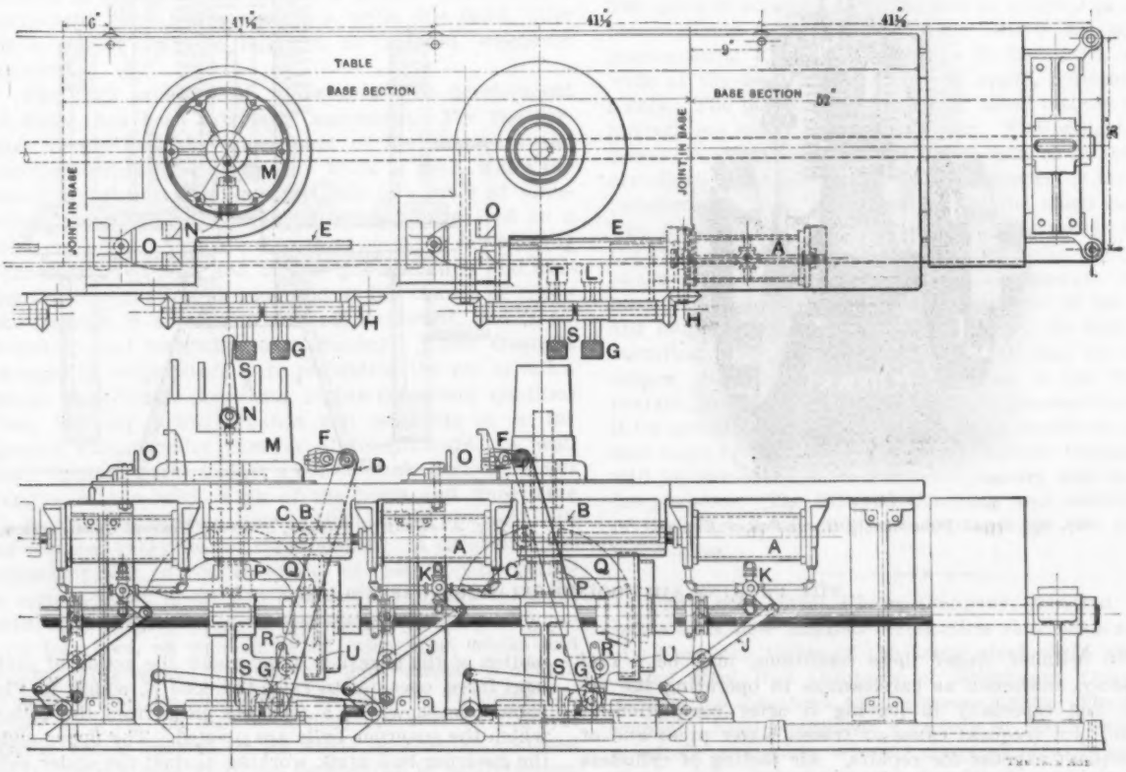


Fig. 2.—Plan and Elevation of First or Power Section, with Two Drawing Units.

A SECTIONAL MULTIPLE BLOCK WIRE BENCH.

an antifriction roller, C, bearing against the draw out lever D, which is pivoted at its lower end and passes upward through the slot E in the table top. At the upper end of the lever, above the table, is attached the vise F for gripping the wire at the die and drawing it through a sufficient distance to allow its attachment to the rotating drum. At the right hand head of Fig. 2 the vise F is seen at the block holder ready to grip the wire, while at the left hand head the draw out mechanism is shown in the position corresponding to a completion of its work. The operation of this portion of the machine is controlled by the right hand pedal G, downward movement of which rotates the shaft to which it is attached and, by the bevel gears at H and the connection J, throws the four-way cock K into a position such that the air from the supply pipe passes to the left hand end of the cylinder, while the right hand end is at the same time opened to the atmosphere. The draw out mechanism is then forced into the position shown at the left of Fig. 2. To return the vise F to the block holder for a repetition of the draw out operation, the pedal L opposite to G is pressed, reversing the four-way valve K, admitting air to the right hand end of the cylinder and allowing exhaust from the left hand end.

The draw out operation completed, the end of the wire is attached to the drum M by means of the eccentric cam clamp N. The lever handle actuating this clamp is attached to a short shaft passing through a long bearing and carrying outside the flattened portion of the drum a serrated eccentric cam, by means of which the end of the wire may be quickly and positively clamped against the top of the toothed plug. The die block holder O is pivoted upon the table of the machine so as to give a fair lead to the wire during the draw out operation and then rotate through the arc necessary to give an equally fair lead to the drum when it is brought into use.

The drum is keyed to a vertical shaft whose lower end rotates within a ball bearing step, P, carried upon the cap of the main shaft bearing. Immediately above the step bearing P is keyed the hub of a bevel gear, Q, whose arms are arched to bring the teeth down close to the main shaft, so as to properly mesh with the driving pinion R. This pinion carries upon its sleeve hub the loose half of a friction clutch, whose engagement and release are controlled by suitable lever, rod, crank and bevel gear connection to the pedals S and T. Depression of pedal T closes the clutch and starts the drum into operation; the clutch is released and the drum motion stopped by depressing pedal S. Acting in conjunction with the clutch mechanism is a brake, which comes into action to quickly stop the drum immediately upon release of the clutch. As seen in Fig. 2, this brake is at U, the drawing showing the manner in which the brake shoe bears upon the interior of a flange upon the loose half of the clutch. The construction and method of operation for this brake are somewhat different in the machine shown in Fig. 1. Here the connecting rod joining the crank upon the bevel gear shaft to the clutch shifter lever carries a cam plate such that when the connecting rod is thrown to the right for engaging the clutch the cam passes from under the set screw through the end of the brake and the lever. The brake is thus released before the clutch is engaged, but is brought into action when the clutch is thrown out, the cam plate upon the connecting rod passing under the set screw, raising it and with it the brake lever, so as to quickly stop the rotating drum. A set screw is provided, with a lock nut, so that adjustment of the brake may be readily effected and secured when desirable.

The clamp for gripping the wire upon the drum, as already described, is a new feature, and is believed to offer the most convenient method yet devised for practically instantaneous gripping and releasing of the wire. The clutch used for driving the drum of each section of the machine is of the regular Falls type, so far as its operation as a clutch is concerned, only the brake flange being specially arranged for use as already noted. The friction ring of the clutch is carried directly upon the sleeve hub of the driving pinion. One of the purposes in view in the design of this machine was the attainment of high speed. It is stated that with ¼-inch wire 80 rotations per minute of an 18-inch drum may be made. This corresponds to 375 feet per minute for the wire through the dies. The makers are the Waterbury (Conn.) Machine Company.

OBITUARY.

ROBERT W. BLANKENSHIP.

Robert W. Blankenship, superintendent and general manager of the Old Dominion Iron & Nail Works, Richmond, Va., met a sudden and tragic death on January 22 in the forebay of the company's horseshoe mill on Belle Isle. While alone in the mill, during the dinner hour, inspecting some repairs, it is supposed that he was seized with vertigo and fell between the timbers into the upper part of the forebay, which feeds the great waterwheel that drives the machinery in the horseshoe department, his body being carried into the supply pipe and thence to the wheel, whence it was recovered when he was missed, three hours later. Mr. Blankenship was thirty-eight years old and was a son of Robert E. Blankenship, for many years president of the Old Dominion Company. He was a graduate of Stevens Institute of Technology of Hoboken, N. J., and for the past 16 years had been connected with the Old Dominion Works. Several years ago he was made superintendent of the company's Belle Isle plant, and three months ago, on the resignation of President Gifford V. Lewis, he became general manager and head of the concern.

NOTES.

MOTT C. HEWITT, one of the best known structural iron superintendent in the country, died January 29 at Trenton, N. J., from Bright's disease, aged fifty-two years. He was born in New York city and became connected with the structural iron business at an early age. Of late, Mr. Hewitt had been connected with H. T. Converse & Co. of Boston, in charge of their structural work in New Britain, Conn. He was a nephew of Abram S. Hewitt.

E. P. HAYES, president of the E. P. Hayes Mfg. Company, Oshkosh, Wis., manufacturers of milling machinery, died January 14, aged sixty-eight years. Mr. Hayes was the inventor and patentee of a number of useful mechanical devices and apparatus.

RUBENS PEALE PATTERSON died at Wayne, Pa., on January 29, aged forty-six years. Mr. Patterson came of a family closely identified with the coal and iron interests of Eastern Pennsylvania for the past 75 years. He was a chemist and blast furnace manager, having been connected with the Phœnix Iron Company, the E. & G. Brooke Iron Company, the Thomas Iron Company, the North Branch Steel Company, the Pulaski Iron Company, the West Roanoke Furnace Company and the Franklin Furnace Company. He also built the Dora furnace at Pulaski, Va., now belonging to the Virginia Iron, Coal & Coke Company. Mr. Patterson had been in poor health for a number of years and for several years past had been unable to take any active duties. He was a member of the American Institute of Mining Engineers.

Architects and builders, who make it a business to remodel buildings, are extremely busy in Chicago and the West now, as a result of the rigid enforcement of rules and ordinances for fire protection. Not only theaters and halls are undergoing reconstruction, but many churches and other places of assembly will have to be completely remodeled. Every manufacturer of fire escapes and steel and iron stairways is crowded with rush work. Thousands of workmen are finding employment, and it is believed that in Chicago alone $1,000,000 will be expended for rendering buildings safe that have not been sufficiently so.

Barely five years ago the present system of supplying electric energy from Niagara Falls to Buffalo was inaugurated, yet to-day nearly one-half of the horse-power required to operate the vast amount of machinery within the city's limits comes from this one source. A great impetus has been given to the industrial growth of Buffalo by the introduction of the use of Niagara power, many manufacturing establishments having located there in recent years to secure the advantages derived from cheap electrical energy.

The Production of Pig Iron in 1903.

James M. Swank, general manager of the American Iron and Steel Association, has published his statistics of the production of pig iron in the United States for 1903, the report being based on complete returns from every furnace in the country.

The total production of pig iron in 1903 was 18,009,252 gross tons, against 17,821,307 tons in 1902, 15,878,354 tons in 1901, 13,789,242 tons in 1900, 13,620,703 tons in 1899 and 11,773,934 tons in 1898. The following table gives the half yearly production of pig iron in the last four years, in gross tons:

Periods.	1900.	1901.	1902.	1903.
First half	7,642,569	7,674,613	8,808,574	9,707,367
Second half	6,146,673	8,203,741	9,012,733	8,301,885
Totals	13,789,242	15,878,354	17,821,307	18,009,252

The output by States was as follows:

Total Production of Pig Iron.

Production.—Gross tons of 2240 pounds. (Includes spiegeleisen.)

States.	First half of 1903.	Second half of 1903.	Total for 1903.
Massachusetts	1,419	1,846	3,265
Connecticut	7,142	7,359	14,501
New York	270,443	282,474	552,917
New Jersey	106,387	105,280	211,667
Pennsylvania	4,498,038	3,713,462	8,211,500
Maryland	166,801	157,769	324,570
Virginia	322,529	221,505	544,034
North Caroline, Georgia	34,001	41,601	75,602
Alabama	777,870	783,528	1,561,398
Texas	5,023	6,630	11,653
West Virginia	106,970	92,043	199,013
Kentucky	53,034	49,407	102,441
Tennessee	227,259	191,109	418,368
Ohio	1,860,334	1,427,100	3,287,434
Illinois	838,655	853,720	1,692,375
Michigan	111,953	132,756	244,709
Wisconsin, Minnesota, Missouri	157,241	126,275	283,516
Colorado, Oregon, Washington	162,268	108,021	270,289
Totals	9,707,367	8,301,885	18,009,252

The production of coke and anthracite pig iron was as follows:

Production of Anthracite and Coke Pig Iron.

	First half 1903.	Second half 1903.	Year 1903.
New York, New Jersey	359,917	372,291	732,208
Pennsylvania	4,496,744	3,710,686	8,243,430
Maryland	165,667	156,647	322,314
Virginia, North Carolina, Georgia	339,773	234,493	574,266
Alabama	741,271	747,020	1,488,291
West Virginia	106,970	92,043	199,013
Kentucky	53,034	49,407	102,441
Tennessee	225,594	189,227	414,821
Ohio	1,857,028	1,420,866	3,277,894
Illinois	838,655	853,720	1,692,375
Michigan	.....	.....	.....
Wisconsin	109,671	99,341	209,012
Minnesota, Missouri, Colorado	179,399	104,104	283,503
Totals	9,473,723	8,029,845	17,503,568

The production of charcoal iron by States was as follows:

Production of Charcoal Pig Iron.

	First half 1903.	Second half 1903.	Year 1903.
Massachusetts	1,419	1,846	3,265
Connecticut	7,142	7,359	14,501
New York	16,913	15,463	32,376
Pennsylvania	1,294	2,776	4,070
Maryland, Virginia	1,508	4,286	5,794
Georgia	16,383	25,449	41,832
Alabama	36,599	36,508	73,107
Texas, Tennessee	6,688	8,512	15,200
Ohio	3,306	6,234	9,540
Michigan	111,953	132,756	244,709
Wisconsin, Missouri, Oregon	29,512	30,851	60,363
Totals	232,717	272,040	504,757

The production in the leading districts in Pennsylvania and Ohio was as follows:

Districts.	First half of 1903.	Second half of 1903.	Total for 1903.
Pennsylvania:			
Lehigh Valley	370,477	278,344	648,821
Schuylkill Valley	311,299	239,261	550,560
Low. Susquehanna Valley	271,305	226,301	497,606
Juniata Valley	124,867	108,832	233,699
Allegheny County	2,255,389	1,956,180	4,211,569
Shenango Valley	720,800	417,361	1,138,161
Miscellaneous bituminous	442,607	484,407	927,014
Charcoal	1,294	2,776	4,070
Ohio:			
Mahoning Valley	714,792	549,167	1,263,959
Hocking Valley	21,800	5,100	26,900
Lake counties	465,691	363,213	828,904
Miscellaneous bituminous	472,400	358,052	830,452
Hanging Rock bituminous	182,345	145,334	327,679
Hanging Rock charcoal	3,306	6,234	9,540

The output of Bessemer and low phosphorus pig was as follows:

Production of Bessemer and Low Phosphorus Pig Iron.

Districts.	First half of 1903.	Second half of 1903.	Total for 1903.
New York and New Jersey	39,112	90,211	129,323
Pennsylvania:			
Lehigh Valley	37,722	68,462	106,184
Schuylkill Valley	37,071	40,811	77,882
Low. Susquehanna Valley, Juniata Valley	187,902	180,843	368,745
Allegheny County	1,738,122	1,538,728	3,276,850
Shenango Valley	486,722	319,986	806,708
Miscellaneous bituminous	295,670	281,104	576,774
Maryland	165,137	156,647	321,784
Virginia and Alabama	3,299	.....	3,299
West Virginia	106,970	91,718	198,688
Kentucky and Tennessee	9,615	17,241	26,856
Ohio:			
Mahoning Valley	525,965	346,793	872,758
Lake counties	436,105	279,503	715,608
Hanging Rock bituminous	52,830	48,142	100,972
Miscellaneous bituminous	444,543	288,795	733,338
Illinois	710,199	676,484	1,386,683
Michigan, Wisconsin and Minnesota	75,096	36,244	111,340
Missouri and Colorado	128,539	47,577	176,116
Totals	5,480,619	4,509,289	9,989,908

The production of basic pig iron was as follows:

Production of Basic Pig Iron, Not Including Charcoal Iron.

	First half 1903.	Second half 1903.	Year 1903.
New York and New Jersey	74,828	42,974	117,802
Pennsylvania:			
Allegheny County	426,970	364,205	791,175
Other counties	439,241	186,837	626,078
Virginia, Tennessee and Alabama	153,861	114,138	267,999
Ohio, Missouri and Colorado	108,903	128,769	237,672
Totals	1,203,803	836,923	2,040,726

Unsold Stocks.—The stocks of pig iron which were unsold in the hands of manufacturers or which were under their control in warrant yards and elsewhere at the close of 1903, and were not intended for their own consumption, amounted to 591,438 tons, against 126,301 tons on June 30, 1903, and 49,951 tons on December 31, 1902.

The American Pig Iron Storage Warrant Company held no pig iron whatever in any of their yards on December 31, 1902, but on December 31, 1903, it held 47,200 tons, of which 40,149 tons were still controlled by the makers and 7051 tons were in other hands.

Induced Draft for the St. Louis Exposition Boiler Plant.—The boiler plant of the St. Louis Universal Exposition will present some striking and unique features as compared with the Chicago World's Fair, especially in the matter of mechanical draft, of which very little, except in small outfits, was in use at the time of the Chicago Exposition. Practically, all of the boilers on exhibit, in service, will be equipped with Buffalo mechanical induced draft fans, some of them of unusually large proportions. The total horse power of boilers to be thus equipped is 17,500, including various standard types of boilers, such as the Cahall, Heine, Geary, Durr, Hohenstein, &c. Wherever space will permit, fans are being installed in duplicate, each of sufficient capacity to take care of its battery of boilers separately. The construction of the fans and engines for the Heine boilers is well

under way, and involves two fans, each 240 inches in diameter, driven by direct attached Buffalo horizontal engines. The total amount of mechanical draft used at the Exposition will be by far the most striking and practical illustration of the utility of fans over high stacks or chimneys ever exhibited, and the total horse-power of boilers at the St. Louis Exposition served by mechanical draft fans, all of which are being furnished by the Buffalo Forge Company, Buffalo, N. Y., will comprise an installation which, in magnitude and interest from an engineering standpoint, has never before been equaled.

The Heppenstall Forge & Knife Company.—The Heppenstall Forge & Knife Company have been organized at Pittsburgh and have taken over the business of the Pittsburgh Shear, Knife & Machine Company. The concern have sold their machinery business to the Erie Foundry Company, Erie, Pa., but are now building a large new forge plant. It will be fitted throughout with new hammers, and all the machinery will be run by electricity. The new company will make a specialty of the manufacture of forgings and shear knives. The officials are: S. Heppenstall, president; W. R. Kuhn, vice-president, and C. W. Heppenstall, secretary and treasurer.

The General Electric Company have established a drafting room apprenticeship course, to which young men who are able to pass a satisfactory examination in arithmetic are eligible. The course is intended to fit applicants for drafting room positions. Further information can be obtained by application to J. W. Upp, engineer in charge of drafting room, General Electric Company, Schenectady, N. Y.

The United States Graphotype Company announce that they will abandon their plant at Thompsonville, Conn., and will consolidate their business at New York. The Thompsonville plant has been in operation for several years, most of the work, however, being experimental.

A Very Large Automatic Gear Cutting Machine.

What is said to be the largest entirely automatic gear cutting machine ever built has recently been constructed by Gould & Eberhardt, Newark, N. J., and installed in the shops of the R. D. Nuttall Company, at Pittsburgh, Pa. There have been larger machines built for gear cutting, but all such have been no more than semiautomatic, whereas the Nuttall machine is entirely automatic in all its functions; once set and started, it requires no further attention until the gear to be cut is completed. While differing in detail and in construction from the builders' smaller gear cutters of most recent design, the new machine involves essentially the same principles, so far as operation is concerned. It is designed for cutting spur gears only, up to a maximum of 12 feet pitch diameter by 24 inches face. A rotary cutter is used and circular pitches of 4½ inches, and even larger, are within the capacity of the mechanism. The total weight of the machine is about 40,000 pounds.

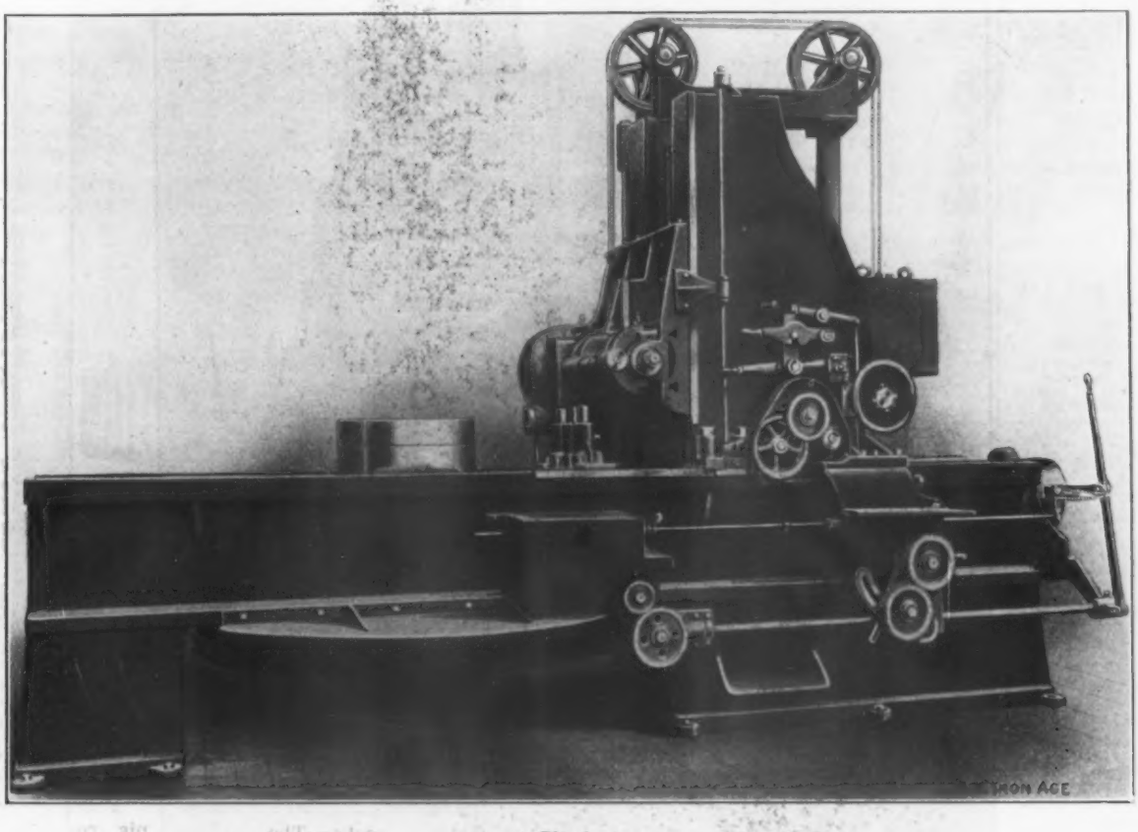


Fig. 1.

A VERY LARGE AUTOMATIC GEAR CUTTING MACHINE.

Having been designed for cutting large, heavy gears of coarse pitch, the machine is arranged to receive the gear blank in the horizontal position instead of supporting it upon an arbor between two upright columns, as in the makers' smaller machines. This gives a very rigid support to the gear blank. All parts are designed upon the anvil principle, so as readily to carry the weight, take the cutting stresses and absorb vibrations. The cutter slide works vertically upon an upright stanchion or housing, which is movable longitudinally of the bed either by power or by hand. The work barrel and arbor, as well as the worm dividing wheel, are rigidly and securely fixed to the bed of the machine, and the setting of the cutter at the proper pitch radius from the center of the blank is made by moving the upright stanchion. The exact movement of the stanchion to a fixed pitch radius is indexed by means of a graduated dial and scale, in connection with which is provided a stop which may be set to terminate the movement of the stanchion at any predetermined point.

The cutter slide has a generous flat bearing surface

against the upright and is counterbalanced by a 3000-pound weight suspended by two wire cables passing over double grooved pulleys, as plainly shown in the three illustrations. The cutter spindle turns in bearings of very heavy proportions; it is driven by a powerful worm and worm wheel drive. In addition to the regular cutter spindle for carrying the large, coarse pitch cutters, an auxiliary spindle is furnished for using smaller cutters up to as coarse as 1 diametral pitch. The metal chips produced by the cutter and also the lubricant for keeping the cutter cool fall directly into a compartment in the base. The lubricant is thence separated by gravity and flows into a pocket or well, from which it is again pumped to the cutter. The chips may be removed through the opening in the side of the base, plainly seen in Fig. 1.

The dividing wheel worm is directly beneath the bed and is completely covered with a substantial guard to keep out all chips, dirt, &c. It is of large diameter, and is made in halves upon the same principle and with the same accuracy as are the dividing worms in the smaller machines built by the same company. While divisions for the different numbers of teeth are arranged to be made entirely automatically through combinations of change gearing, the machine is also arranged to be operated semiautomatically, the dividing mechanism being tripped by hand for each tooth if desired. In Fig. 3 a large gear is shown mounted upon the machine. This was an old discarded mortise wheel, used simply for purposes of testing the machine. It was 10 feet in diameter. The illustration shows its condition at the conclusion of work upon it, after all the teeth have been cut away. In operating upon this gear, whose mortised construction imposed excessively trying conditions, it was found that, with the machine working automatically, the greatest error between any two successive teeth of the wheel was 0.0015 inch.

The machine requires only a single source of power. Fig. 3 shows it driven by a belt to tight and loose pulleys; these pulleys of course might readily be replaced by an electric motor for direct and individual driving. From this main drive all movements, with one exception, are actuated through splined shafting and gearing, the one exception being that shown in Fig. 3, where a single belt is used.

Each movement of the machine is complete in itself and cannot take place unless all previous movements have been fully and correctly completed. A very essential feature of the construction provides that unless the division by the worm wheel is complete the cutter carriage cannot possibly feed downward against the work. This always takes place entirely automatically and requires no adjustment whatever for any size of gear. The control of this feature is by means of the system of levers best seen in Fig. 1 directly between the cutter spindle and the counterweight. The arrangement is such that when at the completion of a cut the mechanism automatically raises the cutter slide, the top one of the three levers shown, which is a trigger lever, engages to prevent the starting of the feed mechanism until the spacing for the next cut has been completed. The trigger lever then releases its hold, allowing the mechanism to proceed with its operation.

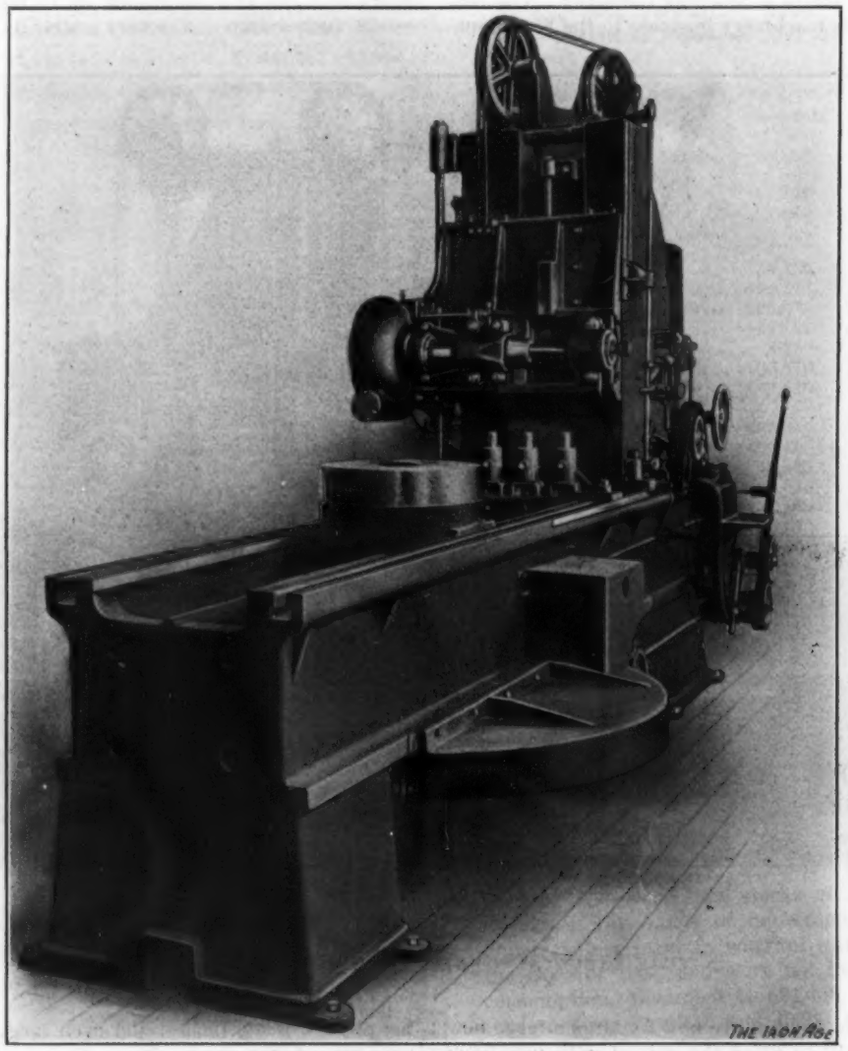


Fig. 2.

A VERY LARGE AUTOMATIC GEAR CUTTING MACHINE.

Lake Superior Mining News

DULUTH, MINN., January 30, 1904.—Six exploratory drills are working on lands belonging to the Longyear Mesaba Iron & Land Company in the northeast quarter of the southwest quarter of section 3 T 58 R 15, and this is the most extensive exploratory operation now under way in the entire Lake Superior region. These drills are finding an excellent ore body. Two holes are already in iron, and others may find it. This is close to the Miller mine of the Pitt Iron Mining Company (La Belle Iron Works), which is now idle, but is to resume in the spring. A town site is planned for the northeast of the northwest of section 10, less than a mile south from where this ore is being cut by the drills, and extensive operations are under way there to determine the character of the ground upon which it is proposed to place the town. One notable hole has been sunk—notable in that it does not coincide with theories as to the deposition of Mesaba ores, as well as on account of its depth. It was sunk 662 feet through surface and slate and 400 feet through underlying taconite, in which were found many thin, but rich, seams of iron ore. Under these 1066 feet the drill cut granite, and the hole was abandoned. Very few drill holes have been sunk to such a depth on the Mesaba range; one in this immediate vicinity in the beginning of operations on the range by E. J. Longyear, who also has charge of the present work there. This original hole cut taconite its entire depth. Of course a 1000-foot hole is not especially unusual on other lake ranges. The Consolidated Lake Superior sank one 2400 feet two years ago in the Republic fold, but they are very rare on the Mesaba, where the character of formation is not generally supposed to require such depth.

The Oliver Mining Company are engaged in but two explorations on the Mesaba range—one at Genoa mine, with three drills, and one at Morris mine. The company have none elsewhere in the lake region. Just now G. G. Hartley and associates have several drills on the Mesaba. In the western end of the Marquette formation, at old Taylor mine, M. L. Fay and others have installed a diamond drill this week, and the Bessemer Iron Company will have one next week. There will be four or five drills there shortly if the formation shows up satisfactorily. Work with pits is looking very well.

The Duluth & Superior Iron & Steel Company have been organized and are trying to sell stock throughout Minnesota. It is a long time since any stock selling iron mining company was floated in this region.

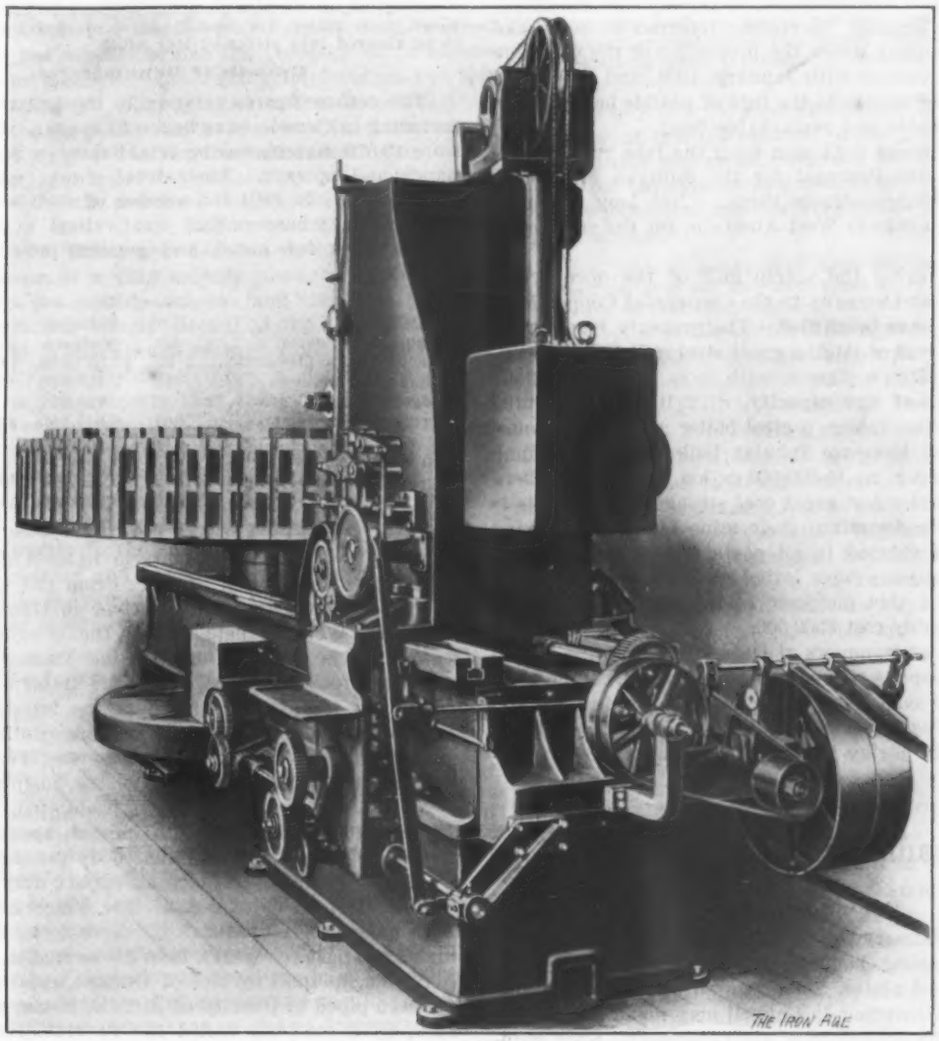


Fig. 3.

A VERY LARGE AUTOMATIC GEAR CUTTING MACHINE.

The Cleveland Cliffs Iron Company have an option on lands adjoining Donora mine of the United States Steel Corporation, in T 59 R 15, and will commence explorations shortly. This land was supposed to belong to the latter concern, until the courts pased on boundaries not long ago.

It is evident that the great bulk of United States Steel ore from the Mesaba range will move to Lake Superior the coming year over the Duluth, Missabe & Northern road. This road will care for all ore from mines belonging to the Corporation and lying west of Eveleth, and of Adams and Spruce at that place. This includes the enormous Hibbing district, with its eastern and western groups of half a dozen great mines each. It includes, also, the great Mountain mine, with its 1,300,000-ton annual average output.

The Commonwealth Iron Company, operating Bristol mine, Menominee range, have decided to operate full force and are taking back the men let out two weeks ago. On-

the other hand, work at Amazon, a promising exploration on the western Gogebic, has stopped for the present. The Northern Iron Company, operating Eleanor mine, at Loretto, have taken on the Cuff exploration and are doing work east of Loretto. In order to handle its ore traffic to better advantage, the Chicago, Milwaukee & St. Paul road is building 500 100,000-pound wood ore cars at its own shops. This road ships to docks at Escanaba and to the Soo line, near Gladstone.

The question of employees of the United States Steel Corporation who subscribed to the profit sharing plan and have since been discharged has been settled by continuing their names on the rolls, without pay, until such time as they shall get back or refuse to accept work offered them. While not at work payments will be optional, and the employee loses no rights, payments not being made. The absorption of the Minnesota Iron Company into the Oliver Iron Mining Company, heretofore referred to, will take the former company under the provisions of the Carnegie aid fund, commencing with January, 1904, and will add a large number of miners to the lists of posible beneficiaries of that most noble and remarkable fund.

Several diamond drill men from the lake region have just been sent to Portugal for the Sullivan Machinery Company, having contracts there. Not long ago men were sent from here to West Australia for the same company.

Deeds conveying the stamp mill of the once active Arcadian Copper Company to the Centennial Copper Mining Company have been filed. The property transferred includes 400 acres of land, a great steel mill building containing three 550-ton stamps, with room and foundations for three more of like capacity, with 108 jigs and nine double deck slime tables, a steel boiler and engine house containing five immense tubular boilers, a steel pump house containing a 15,000,000-gallon triple Nordberg pump, a large pier and great coal storage docks. This is the last of the Arcadian, their mine machinery having been sold and shipped to all parts of the world. The Centennial Company have levied an assessment of $360,000 to pay for this purchase and other improvements. This mill probably cost $500,000.

The strike of trammers at Quincy copper mine is still on. The company have withdrawn their compromise offer, and the men have voted to stay out indefinitely. Quincy's production has been about 1,700,000 pounds a month, and the strike is now in its fourth week.

D. E. W.

Canadian Industrial Notes.

Bounty Regulations.

TORONTO, January 30, 1904.—The act passed last October, establishing bounties on wire rods, structural shapes and steel plates, contains a subsection which provides that the Governor in Council may make regulations to carry out the intentions of the enactment. Such regulations have just been framed and embodied in an order in Council. These provide that the manufacturer must furnish satisfactory evidence to the Minister of Trade and Commerce that the rolled products mentioned have been produced in Canada and sold to Canadian consumers. He will be required to make oath before a collector of customs or justice of the peace, both as to the production and the sale. In all cases the purchaser will have to give a certificate showing that he actually bought the goods accounted for by the manufacturer as sold. This document is necessary, to confirm the claim for bounty. An officer detailed for that service, by the Minister of Customs, is to supervise the manufacture of the rolled products entitled to the bounty. Also the books of the manufacturing concern claiming the bounty are to be subject to the inspection of an officer authorized by the Minister of Trade and Commerce. It is further provided in the regulations that claims for bounty must be made within four months from the time the article is delivered for use or consumption in Canada. Before commencing the manufacture of the rolled products, to which the new bounties apply, four months' notice must be given to the Department of Trade and Commerce, and in that notice it must be specified what one or more of the given articles it is contemplated to make. Added to these particulars must be given the name of the company, the names of its responsible officers, the place of manufacture, the estimated output and some other details. Forms of making the claims are provided by the department.

The bounties, whose payment is to be subject to these regulations, are as follows:

Six dollars a ton on rolled wire rods not over ⅝ inch in diameter, when sold to wire manufacturers for use in making wire in their own factories.

Three dollars a ton on rolled angles, tees, channels, beams, joists, girders or bridge building or structural rolled sections, and on other rolled shapes not round, oval, square or flat, weighing not less than 35 pounds per lineal yard, and also on flat eye bar blanks, when sold for consumption in Canada.

Three dollars a ton on rolled plates not less than 30 inches in width and not less than ¼ inch in thickness, when sold for consumption in Canada for the manufacturing purposes for which such plates are usually required—not including plates to be sheared into plates of less width.

Growth of Manufactures.

The census figures relating to the progress of manufacturing in Canada have begun to appear. In 1891 there were 13,679 manufacturing establishments employing five hands and upward. Their total output was valued at $363,156,797. In 1901 the number of such establishments was 14,650, whose output was valued at $481,053,375. Comparisons for metal and related industries are as follows:

	1891.		1901.	
Name of industry.	Number.	Value of products.	Number.	Value of products.
Agricultural implements	95	$7,252,005	114	$9,597,886
Boilers and engines	42	2,433,878	59	4,626,214
Bridges, iron and steel	6	728,075	6	1,693,000
Carriages and wagons	367	5,942,559	349	6,650,912
Car works	18	9,450,525	33	11,500,816
Iron and steel products	23	4,356,730	29	6,912,457
Ships and repairs	132	3,067,475	39	1,899,836
Smelting	16	3,016,200	12	7,082,384

Export Duty on Natural Gas.

From two sources in Ontario natural gas has been exported to the United States. From the Essex field it was piped across the Detroit River to Detroit city, and from the Welland field across the Niagara River to Buffalo. The exportation via the Detroit River was stopped a few years ago, when the Ontario government caused the pipe to be severed at the international line. That by way of the Niagara River has continued, though repeated appeals have been made by the Welland County municipalities concerned, to have the business restricted by an export duty, if not entirely prohibited. The County Council alone refused to join in such appeals until the present. On the 29th inst. that body passed a memorial praying Parliament to place an export duty of 12 cents per 1000 feet on natural gas. The memorial says "that large quantities of natural gas have from time to time, during the past few years, been discovered in the Niagara Peninsula, in the Province of Ontario, most all of which has been piped to the city of Buffalo, in the State of New York, by a company called the Provincial Natural Gas Company, with headquarters in the city of Buffalo, said to be controlled by the Standard Oil Company, while residents of the cities, towns and villages of this peninsula have asked in vain to be supplied with the product of our own soil, this great heritage, natural gas." It was brought out in the debate in the County Council that the Provincial Gas Company have five lines under the Niagara River carrying gas to Buffalo. Only two, it is said by the company, are used. One line has a capacity alleged to be 8,600,000 feet per 24 hours, under a pressure of 200 pounds. The company's representative, before the County Council, stated that the contract with Buffalo parties called for the delivery of only 575,000,000 feet per year. In Buffalo it is supplied to one distributing center by the company.

Parliament and Tariff.

That there will be a revision of the tariff in the session of Parliament, opening on March 11, is now generally expected. That it will be a sweeping revision no one believes. But the Government's own supporters in the House are calling for an advance in the duties. Several Members of Parliament, on the Government's side, have stated their views publicly in favor of protection.

Of course, the party at present in opposition has always been intensely protectionist, and urges the complete revision of the tariff at once. C. A. C. J.

Merchant Marine Legislation

Opponents Unable to Agree Upon Substitute Measure.

WASHINGTON, D. C., February 2, 1904.—Attention has been drawn anew to the question of legislation in aid of the American merchant marine by a number of measures presented in the House during the past week, representing the views of members who are opposed to direct subsidies, but who recognize the necessity of furnishing aid in some manner to the waning shipbuilding and ship owning industry. Although the entire Democratic minority of the Committee on the Merchant Marine and Fisheries voted against the Gardner bill, authorizing a commission to investigate the advisability of supplying Government aid to the merchant marine, the minority report, which they have just filed, presents no alternative proposition. This report declares that the bill is simply a forerunner of a ship subsidy measure, that it means ultimately the subsidy scheme, and therefore the opponents of subsidy should meet it at the threshold. It declares that a commission of any kind to investigate is unnecessary, inasmuch as there is nothing new to be learned on the subject; that there are volumes of information and of reports treating of the merchant marine, and that the expenditure of the $20,000 provided for under the Gardner bill, would be a useless waste of money. All such commissions, it declares, have two purposes in putting forth the bill at this time, instead of coming directly to the subsidy question. One is to educate the country and prepare its mind for a subsidy, and the other is to carry the matter over the elections of this Fall. The report continues:

> The subsidy or bounty plan is wrong in principle and ineffective in practice. It is without virtue as a remedy and is demoralizing to the political conscience of the country. Once put it in practice and every debilitated and conscienceless private interest will be assailing Congress for aid and relief. Private interests have been aided heretofore, but not often, by direct grants from the Treasury. Subsidies are obnoxious to republican government, where equality of privilege should be the rule and bounties to private enterprise should never be thought of. The great majority of the American people look upon the ship subsidy as a selfish scheme, pure and simple, and the lower house should put the schemes to sleep at the outset.

Owing to the fact that the commission bill provides simply for an investigation, and cannot, for many months, lead to any practical results, the chief interest in this subject is now centering in the Frye bills, extending the coastwise laws to the Philippines and requiring the shipment of military and naval supplies in American bottoms. While these two measures may seem unimportant, as compared with so comprehensive a bill as that pending in the last Congress, providing subsidies for vessels of nearly all classes, nevertheless the advocates of these bills assert that much good can be accomplished by their passage, and that their importance is very generally underestimated. In this connection, a statement was made to the Senate Committee on the Philippines, a few days ago, by Wallace Downey of the Townsend-Downey Shipbuilding Company of New York, indicating the condition to which numerous shipyards have been reduced and the hopeful feeling engendered among shipbuilders by the progress already made in the consideration of the two Frye bills. Mr. Downey said, in part:

Why Some New Shipyards Were Started.

> About two or three years ago I became convinced that we were going to have a ship subsidy bill passed, and I invested of my own and other people's money about $2,000,000 in a shipyard in New York. I can say, in addition to that, four or five shipyards were started along the Atlantic Coast ,involving probably about $30,000,000, and the thing that made it possible for the people that believed in the future of the shipbuilding business to get money to start those shipbuilding yards was that they believed the ship subsidy bill was going to be passed.
>
> As the ship owning interests have told you, they also started in—Mr. Luckenbach, for instance—building new ships. One of Mr. Luckenbach's new ships arrived in New York the other day. I know he believed when he ordered her that that subsidy bill was going into effect. I know that to-day he has another ship tied up at the dock at New York idle—a magnificent ship that can carry about 6500 tons of cargo, upon which I spent a large amount of money to make her a coal carrying or a hemp carrying ship. I know she has been tied up in Brooklyn for weeks, and I believe for months, idle for want of something to do. This is the direct result, again, of the ship subsidy bill not having passed.
>
> As I have stated, a number of these shipyards were started in anticipation of the passage of this subsidy bill, and some of them have gone to ruin and a great many of them are in the hands of receivers to-day, after the most energetic efforts on the part of the people who promoted them, and they were not all dishonestly promoted. I was the means of putting $2,000,000 in a shipyard, and for that amount of money there was not one nickel paid in a promotion fee or commission, and every dollar of that is invested in that shipyard. I have paid out upward of $3,000,000 in wages to shipbuilders, attempting to establish a shipbuilding business, and I tell you, gentlemen, that unless some such legislation as this is put through or a subsidy bill or something done, the death of American shipping and shipbuilding is inevitable.

In reply to a question by Senator Hale, as to whether, in view of the unlikelihood of the passage of a subsidy bill at this session of Congress, about all that could be done for our ship owning and shipbuilding interest would be the passage of Senator Frye's bills, Mr. Downey replied with emphasis:

> Yes, sir; it is the only hope we have. I have almost worked my soul out and have spent every dollar I have in the direction of promoting shipping, and this is the only hope I see.

In spite of the sentiments expressed by Mr. Downey and other shipbuilders and ship owners, and of the fact that the Senate Committee on the Philippines has already reported the Frye bill, extending the coastwise laws to the islands, a few cordage manufacturers are stubbornly opposing this legislation on the ground that it may result in an increase in freight rates on hemp, and have induced their Representatives in Congress to take an active part against the Frye bill. Representative Powers of Massachusetts, a prominent Republican member of the New England delegation, on January 30, introduced a measure intended to forestall the Frye bill, by prohibiting the extension of the coastwise laws to the Philippines until April 11, 1909.

In view of the opposition of Mr. Powers and a few of his colleagues on the majority side of the House, the advocates of the Frye bills have been at some pains to ascertain the probable strength of this faction, and have reached the conclusion that with the exception of a very small number of votes, the bills will receive the solid support of the majority in both houses.

The Standardization of Vessels.

One of the greatest benefits that is expected to result from the extension of the coastwise laws to the Philippine Islands is the opportunity that will be given American shipbuilders of turning out deep sea vessels on a scale of magnitude sufficient to enable them to standardize their output and thus be put in position to sell their products abroad. This point has not been generally understood in Congress in the discussion of the shipbuilding industry in the past, but was carefully set forth at a recent meeting of the Senate Committee on the Philippines by Thomas Clyde, who said, in part:

> In shallow water navigation a type of ship is used which is practically unsalable in the foreign markets. On the other hand, the type of ship which is generally useful in over sea trade on long voyages would be equally useless in our coastwise trade. The result of that is that we have never been able to develop a type of ship which would be generally useful for any purpose to our navy, to our army, or to anybody except the particular people who owned the ship and who built her for their particular purposes.
>
> I have often been asked why it is that the shipbuilders of the United States, enjoying as they do absolute protection—the monopoly of the home market—have never been able, like our manufacturers of steel rails, bridges, locomotives, &c., to sell at least a part of their surplus abroad. The reason is, as I have said, the shipbuilder has never had an opportunity, except in a few isolated cases where people have built for subsidy or in anticipation of subsidy, to build enough ships of a generally useful type that would be salable in the foreign market to make the first beginning toward standardizing his product; and the standardization of his product is the whole secret of economy of production, or a very large part of it.

The Senate leaders hope to bring the Frye bills to a vote during the present month in order that they may be presented to the House in time for passage at the

present session. The outlook for the bill extending the coastwise laws to the Philippines is excellent, and it is believed the measure restricting the carrying of military and naval supplies will be passed, with a slight modification, giving the Secretaries of the Navy and War discretion to use foreign vessels in emergencies. W. L. C.

The Deschamps Down Draft Gas Producer.

A late issue of the *Bulletin de la Société de l'Industrie Minerale* publishes an article written by Jules Deschamps on a down draft gas producer of his invention, designed for the special purpose of producing from a variety of coal or fuel a gas of the most suitable composition for use in gas engines. The author states that while it is a fact that nearly every kind of coal can be used in the Siemens gas producer, the cleaning of the producer is difficult and the gas is charged with too much tar to be used with advantage in a gas engine. On the other hand, the Dawson type gas producer was especially designed to supply gas for power purposes, but these producers give little satisfaction when other than anthracite coal or coke is used.

Hence the problem that the inventor had to solve was to design a producer in which a fuel with a high percentage of volatile matter could be used advantageously for the production of a gas not only well adapted to gas engine practice, but which at the same time could be carried through long flues without undue deposit. In other words, the gas should contain practically no tar nor hydrocarbons susceptible of subsequent decomposition by the formation of soot.

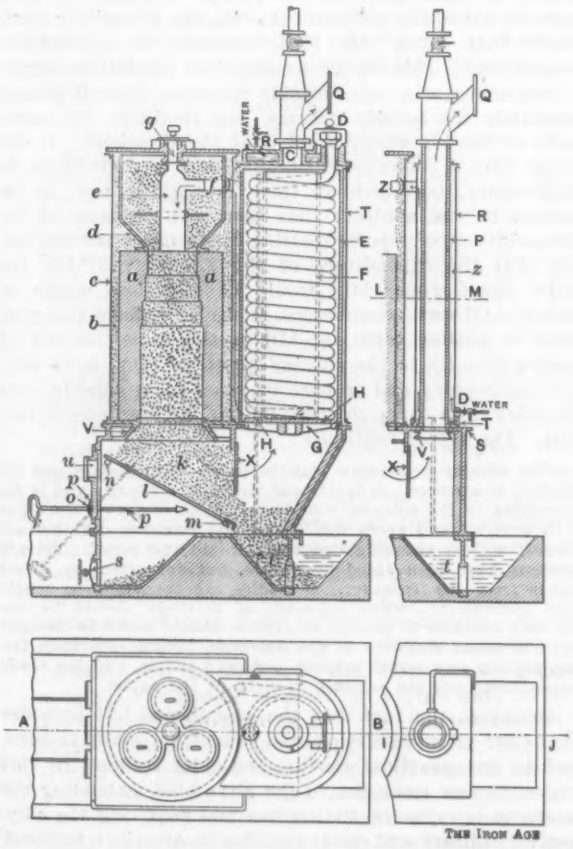
The natural products of the distillation of coal being hydrocarbons, it was necessary to change these by means of oxygen or steam into carbon monoxide and hydrogen. When making this transformation with oxygen, obtained from the air or from spent gases, the resulting mixture, owing to the introduction into it of some nitrogen, will naturally lose some of its calorific power, but with the use of steam the calorific power will not suffer. Still the small amount of calorific power lost when using air will be counterbalanced by the advantages resulting from the possibility of easily using the class of coal mentioned for the manufacture of gas suitable both for power and heating purposes.

The easiest way of reducing the carbides resulting from distillation and of transforming them as desired is obtained with the use of a down draft producer, where the gases generated in the upper regions of the charge of coal traverse in their downward motion a large body of incandescent coke, and where they will be transformed into a mixture of carbon monoxide and hydrogen, if brought simultaneously in contact with oxidizing elements, such as air or steam. The contact with oxygen is necessary, so that the products of distillation at that high temperature be transformed into lighter hydrocarbons with deposit of free carbon.

In order to realize the best conditions the inventor resolved to distill the coal without air in the upper region of the charge, and to introduce the air only into a lower region, higher in temperature, where it will meet the products of distillation and transform them. It is also necessary for good and uniform results that the air be introduced into the center of the down coming gases, so as to insure a good mixture of both and so prevent the air from following the line of least resistance along the walls of the producer.

For reasons that will be made clear a little later the inventor decided to discard any producer working with natural draft or under air pressure obtained by blowing with a steam nozzle. His producer, illustrated in the accompanying engravings, is worked with a suction or exhaust fan (not shown on drawing); the air drawn into the apparatus is previously heated in a recuperator, also shown on drawings. The producer proper is composed of a wrought iron shell, *c*, *c*, lined inside with a fire brick lining, *a*, *a*, and a layer, *b*, *b*, of bad heat conducting material between shell and fire brick. This isolator extends to the top of the hopper. The fire brick lining, *a*, *a*, which widens out in a downward direction, rests on an annular plate, V. This plate, in its turn, is supported by a cast iron crown, resting on the frame of the ash pit. On top of the brick lining rests a cast iron hopper, *d*, widening out in the upper end and reaching to within a short distance of the top plate. This latter is provided with three large coal charging holes, also used for stirring purposes. A cylindrical tuyere, *e*, of stamped steel, suspended from a pipe, *g*, forming the central part of the top plate, reaches down to the combustion zone of the producer. The length of this tuyere changes with the character of the fuel used. Through the opening *g*, closed during the operation, the combustion zone can be stirred and possible clinkers be broken. The hot air, coming from the recuperator, is admitted through a side inlet, *f*, into the tuyere. Holes are placed around the circumference of the latter for the escape of gases that will form in the hopper.

The coal, heated by its contact with the hopper on one side and the tuyere on the other, begins to distill, while



THE DESCHAMPS DOWN DRAFT PRODUCER.

sinking down gradually, and the gases in their downward movement, reaching the reducing zone, mingling with the hot air from the tuyere, are reduced, then traverse the column of incandescent coke below, and by their contact with the cooler ashes in the lower regions are already partly cooled before they leave the producer through the openings in plate X. This latter is suspended from the cast iron crown plate, forming a kind of vertical grate, or screen, through which the gases can escape to the recuperator. The ashes and coal in the producer are supported on inclined parallel grate bars *l*, near enough to let ashes and small pieces fall through. These bars can be rocked on a horizontal shaft, *n*, by means of a shaft placed at *m* in such a manner that each alternate bar will be lifted while the other bars are lowered. This has a shearing effect on the clinkers, which are thereby prevented from sticking to the grate bars. The ash pit below the grate bars is inclosed in a practically air tight compartment provided with doors, closed during the operation. The ashes follow the inclined grate bars and are deposited in *t*, a water sealed compartment, from which they can be removed at will.

The heat recuperator, which the gases enter after leav-

ing the producer, consists of a coil of lap welded steel pipe, *z*, through which the air circulates in a downward direction, then rises again and enters the producer through *f*. The coil is located in an annular chamber, the outer wall of which is protected against cooling by suitable covering. The air enters through R into a chamber provided in the cover C of the recuperator. This chamber contains water with a constant level, serving for cooling purposes as well as for providing the necessary amount of moisture to the air, which, after having passed through the chamber, enters the coil at D. The gases, rising in the annular space, will cool down gradually, while the air, flowing in the opposite direction, will heat up. At Q the gases leave the recuperator.

This arrangement gives good results. The temperature of the air leaving the recuperator is much higher than the temperature of the gases after their passage through it. Still as such a recuperator, in order to give satisfaction, requires ample proportions, consequently is costly and cumbersome, the inventor builds a cheaper and smaller kind whenever the yield of gas is not a main issue. This arrangement is represented in right hand section and plan. It is composed of a vertical central pipe, P, through which the gases from the producer rise to escape through Q, and a concentric shell, R, forming with the former an annular space, Z, for the passage of the air entering at D, and escaping at Z, to flow to the producer. The concentric shell R rests on the flange T of the central pipe P. The joint is made tight by a water seal, which also supplies some moisture to the air. This style of recuperator is much cheaper and for certain purposes gives ample satisfaction.

The inventor states that the heat recuperator has a beneficial effect on the quality of the gas.

Even by taking all necessary precautions, the gases leaving the producer still contain small amounts of tar, and if they are cooled suddenly this tar remains in its original state, and as soon as it again reaches a zone of higher temperature near the furnace, or enters the valve of the engine, it happens often that this tar is decomposed, with a deposit of a heavy residue.

With the use of a heat recuperator, leading to a more gradual cooling, the tendency toward the decomposition of the remaining carbides has been proved by experience to be greatly reduced, and the resulting gas is better and more uniform in quality. While in general the use of hot air has great advantage, especially with a certain class of coal, with some others, however, the temperature in the reducing zone becomes too high. This the inventor remedies by introducing an adequate amount of moisture with the coal, or, what is still better in some cases, by mixing a certain amount of spent gases, containing carbonic acid, with the air entering the tuyere. By such means he can regulate the temperature in the combustion zone to the point where it will give the most favorable results.

The use of a down draft producer worked by suction does away with any loss of gas during charging or cleaning; but a fan is necessary to exhaust the gas and to compress it in the gas holder. Advantage is taken of this circumstance to purify the gas after it leaves the producer.

The author cools the gas in a scrubber, then removes the last particles of gas by means of a centrifugal turbine, gathers the tar in a collector and filters the gas through sesquioxide of iron to remove the sulphureted hydrogen, if deemed necessary.

Results of Tests.—The producer has now had a practically continuous run of more than four months, during which time part of the gas was used to drive a gas engine; the balance was used for heating purposes. This arrangement made it possible to use a small gas engine and yet run the larger producer to its full capacity and test it thoroughly. During all this time different kinds of coal were tested; the run with each kind of coal lasting two weeks on an average. The fuels tested were lignite, peat, tan, rich and poor gas coal, some with very fusible ash, some run of mine and some in nearly a powdered state.

The results were uniform. Even with swelling coals and very fusible ash the producer remained clean. During one month's continuous run different kinds of coal were successfully treated without interruption, and after emptying the producer at the end of the month, through the ash pit, no clinkers were found to stick to the walls or to the grate bars.

The gas engine, run at one time continuously for 12 days and 11 nights, was found to be perfectly clean and ready to start up again after inspection.

The experiments led to the following conclusions:

1. The limit of moisture that the fuel may contain in a down draft producer varies with the quality of the fuel.

2. The final gas never contains more than 0.02 per cent. (2 per 1000) of tar.

3. The run of mine is used with great advantage, but with a somewhat decreased yield.

4. A homogeneous mixture of coal should be used. The author gives many details in regard to the work of each and every kind of fuel used, the gas obtained from them and their behavior in the gas engine.

We will reproduce here the results of two tests made with two different kinds of coal.

First Test.—Gas coal, with 38 per cent. volatile matter and 10 per cent. ash; heating power, 7800 calories. Run of mine coal. Continuous run of 12 days and 12 nights with the gas engine. Observation test lasted 60 consecutive hours, with the use of two gas meters and one electric meter, all three loaned and guaranteed by the Compagnie Continentale.

Coal consumed during 60 hours, 1718 kg. (3786 pounds); gas produced, 6907 c. m. (243,955 cubic feet); used in engine, 2473 c. m. (87,346 cubic feet). Dynamo run by engine developed 782 kw. If all the gas had been used in the gas engine he would have obtained $\frac{6907 \times 782}{2473}$ kw., with a consumption of coal per kilowatt of $\frac{1718 \times 2473}{6907 \times 783} = 780$ grams. With a yield of 83 per cent., this corresponds to 480 grams (1.05 pounds) per horsepower hour.

While this yield is good, without being remarkable, it is important, in so far that it was obtained with that kind of fuel. Engine, after test, was found to be in a perfect state of cleanliness and ready to be started up again.

Second Test.—Coal from Seraing, containing 17 per cent. of volatile matter and 15 per cent. of very fusible ash. This coal in Seraing is considered to be most difficult to treat. It swells considerably and the clinkers fasten very strongly to the wall of the ordinary producer. In Seraing they use it for coking purposes.

The tests were made under the supervision of the engineers from Seraing, who found, after the tests, that no clinkers had attached to the walls and that the engine was perfectly clean.

That no clinkers fasten to the side walls in this producer is explained by the fact that while the temperature in the central part of the producer in the combustion zone is 1100 degrees C. (1980 degrees F.), it is scarcely 900 degrees C. (1620 degrees F.) against the wall. This latter temperature is not high enough to fuse the slag and to make it stick to the walls.

The Colorado Fuel & Iron Company's Financial Arrangements.—The stockholders of the Colorado Fuel & Iron Company held a special meeting at Denver on February 1. The articles of incorporation of the company were amended by striking therefrom the provision which forbids the company incurring any further debts than for the ordinary running expenses of the company. A resolution was adopted approving and ratifying the transactions by which the company have heretofore raised money for their requirements, and also approving the application of such money in so far as the same had been received and applied, and also directing that the remainder of the money when received should be expended under the direction of the officers and directors to the furtherance of the operations of the company. It is now proposed to issue bonds to the amount of $45,000,000.

The New Star Speed Lathes.

Several new features of interest to users of tools of this class are embodied in the construction of the new 10 and 12 inch Star speed lathes. The head stock spindle and bearings are, of course, of primary importance. The spindle is made from crucible steel forging, has a large central hole, and runs in generous phosphor bronze bearings, self oiling and dust proof. Each bearing is oiled by a double set of wicks, supplying the bearing continuously with a liberal amount of oil. The surplus lubricant runs back into the oil wells, which are arranged to prevent dripping and waste. Refilling of the oil wells at long intervals is the only attention required. The cone pulley has four steps and is finished inside as well as outside, so as to give it perfect balance for high speed work. The head stock casting is of the web pattern, strong and heavy.

The tail stock is of the curved, or cut under, form, the spindle having a combination screw and lever control in connection with a graduated dial. The dial, attached below the hand lever, is graduated to correspond to sixteenths of an inch of movement of the spindle, and is valuable as a guide to the operator in working to a desired depth in drilling, counterboring, countersinking,

THE NEW STAR SPEED LATHES.

&c. The dial is movable and may be set to zero for any position of the hand lever; thus, the counting of graduations for the required depth of cut may start from any desired point. To change from screw to lever motion it is necessary simply to loosen the knurled head set screw at the front of the tail stock, this operation releasing the spindle sleeve. The hand lever may be lifted off and removed when its use is not required. The tail stock has a long bearing on the ways and is firmly locked by means of a lever handle, which is always in place, so that no wrench is required.

The tool rest socket and saddle are locked to the bed by a cam device. Long and short tool rests are provided with the machine, either of which may be securely fastened in the socket by a friction clamp, doing away with the objectionable set screw commonly used. Both locking and clamping devices are also operated by constantly attached levers, avoiding the use of wrenches.

The bed is broad and deep, braced by cross ribs to afford the proper stiffness and rigidity. The front way is flat and the rear one is of the customary V-shape. At the back of the bed is secured a shelf for the reception of tools, &c.

The countershaft supplied with the machine has self oiling and self aligning bearings, a four-step cone to match the head stock cone, and either tight and loose driving pulleys with belt shipper or duplex friction clutches with reverse motion pulleys.

Each lathe is furnished with a face plate, two-point centers and, when desired, with slide rest, draw in chuck and collets, &c. The machine may be furnished mounted upon an oil pan or upon short bench legs. Foot power instead of countershaft drive may also be used. The makers are the Seneca Falls Mfg. Company, 255 Water street, Seneca Falls, N. Y.

The Turbines for Scout Ships.

WASHINGTON, D. C., February 2, 1904.—The Navy Department has submitted a proposition to the Westinghouse and General Electric companies for a complete installation of steam turbines by each company for one of the two 4000-ton scout ships included in this year's naval programme, the expectation being that these companies will each undertake the complete equipment of one vessel upon plans that will enable the Department to make a careful comparative test of the Parsons and Curtis types of engine. Somewhat to the surprise of the Department a third competitor has appeared in the field, the Allis-Chalmers Company having notified the Secretary of the Navy that they are in position to build turbine engines and desire to be considered in connection with any proposals that may be invited for this type of motive power. The officials are much gratified at the interest shown by manufacturers, and it is not doubted that an entirely satisfactory arrangement can be made not only to supply turbine installations for the projected scout ships, but also to give the Department the advantage of any private experiments that may be carried on during the coming year.

Size of Scout Ships Increased.

In deciding to ask Congress for an appropriation to construct two 4000-ton scout ships, the Board of Construction has made an important advance in the plans for testing steam turbines. The original plan involved the building of two 1200-ton scout ships, and the work of designing these vessels and preparing specifications for their motive power was so nearly completed before the change was made that drawings and data for the engines had already been submitted to the Westinghouse and General Electric companies. The information received at the Department from abroad, however, indicated that the proposed scout ships would be easily outclassed by vessels now building for the German Navy, for which turbine installations have already been ordered, and it was therefore decided to increase the size of the two scouts to 4000 tons each.

The prospect of securing the desired appropriation for these vessels is excellent, as Congress appears to take the view that, without regard to the magnitude of this year's naval programme, the United States must keep up with the march of progress and must not be left behind in this important development. Admiral Rae, chief of the Bureau of Steam Engineering, who was recently before the Naval Committee in connection with the pending naval appropriation bill, in reply to an inquiry as to the necessity for the appropriation of $25,000 requested by the Secretary of the Navy to continue the experiments with turbines, emphasized the importance to the Department of acquiring as much information as possible with regard to these engines, and said it was absolutely essential that the engineer officers of the United States Navy should keep abreast of the very latest developments in order to obtain the highest efficiency of which any turbine installations that may be made are capable. While the question as to whether turbines are to be installed in the scout ships will be decided by the Secretary of the Navy rather than by Congress, the Naval Committee are taking very lively interest in the matter, and have indicated their intention to provide at least two scout ships in the expectation that turbines will be employed therein.

Data for Engines.

In working out the plans for the 4000-ton scout ships, the experts of the Bureau of Steam Engineering have made some interesting calculations. It is desired that these vessels shall have the highest possible speed, and, assuming that Congress makes a sufficiently liberal appropriation, they will be given 26-knot speed if that is

found to be practicable. For this purpose it is calculated that the installations must be of at least 20,000 horse-power. Should it be necessary to cut the speed down to 24 knots, the engines will probably be reduced to about 16,000 horse-power; but every effort will be made to develop the highest possible speed. In figuring the space to be occupied by the turbines, as compared with reciprocating engines, less economy has been developed than was originally estimated. The motors themselves occupy considerably less room, but owing to the high vacuum necessarily maintained the auxiliaries require to be considerably larger, especially the condensers, circulating pumps, air pumps, &c. Instead of requiring more space fore and aft and less beam space, as was originally calculated, it is found that to make the most satisfactory layout about the same amount of space is required in all directions as in the case of reciprocating engines.

Owing to the greater diameter of turbine necessary to develop the required horse-power to drive a vessel 24 or 26 knots, the shaft cannot be maintained in a horizontal position, and there has been some anxiety among naval experts lest the necessary pitch should be so great as to develop other complications, including "squatting" of the vessel when running at high speed. Calculations made by the engineer experts indicate, however, that the deviation of the shaft from the horizontal will probably not exceed 4 degrees, which will have very little effect upon the running of the vessel. The tendency to squat is chiefly due to the speed of the vessel, and although the turbine shaft is calculated to make about 500 revolutions, as against 225 for the reciprocating engine, the difference in size and position of the propellers is counted upon to offset the high speed of the shaft. As the propellers used with turbines are smaller than those with reciprocating engines, the tips of the upper plates will be more deeply impressed and less likely to be uncovered by the pitch of the vessel, so that there will be less possibility of racing. But even if racing does occur, there will be no risk of serious injury to the motor, owing to the simplicity of its mechanism.

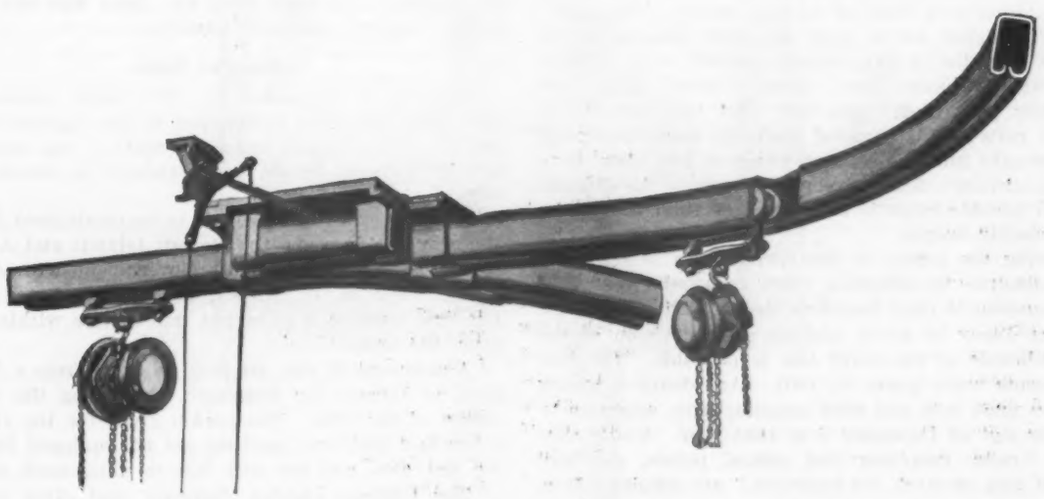
Admiral George W. Melville, who recently retired from the post of Engineer-in-Chief of the navy, has just sailed for Europe with George Westinghouse for a tour of Great Britain and Germany, for the purpose of making an exhaustive study of turbine machinery. Admiral Melville's trip is official and cannot fail to be productive of important results. Special attention will be given by him to development of turbines in Germany, where the Admiralty has ordered two installations, aggregating 15,000 horse-power, for a seagoing torpedo boat and a small cruiser. These will be the first ships of the German Navy in which reciprocating engines have been supplanted by steam turbines. W. L. C.

John D. Rockefeller has resigned as a member of the Board of Directors of the United States Steel Corporation.

A Ball Bearing Switch for Overhead Trolley Hoist Tracks.

Those using or contemplating the installation of trolley hoist or transfer systems involving the use of overhead trackage will be interested in the ball bearing switch of which we present an illustration. The frame is bolted rigidly to overhead supports, and in this frame slides a steel plate, to which are fastened the sections of track leading to and connecting with the different lines. The ends of the plate and the frame parts supporting it have V-shaped grooved recesses, in which are placed hardened steel balls. The switch is operated from the floor by ropes attached to the ends of the controller arms, from which a rod makes connection with the sliding plate. Notches in the curved portion of the controller correspond to the different positions of the switch, and the ratchet actuated by the spring operates in these notches, thus holding the switch securely in whatever position it may be set.

The construction throughout is simple, and it is claimed that the ball bearing reduces to a minimum the necessary force required at the hand rope to operate the switch. It is said that the pull necessary upon the rope is little more than that required to overcome the pressure exerted by the ratchet spring. Only 2 inches of vertical space above the top of the track are required for installation of the switch, making it especially adaptable to places where head room is an important factor. Inasmuch as the switch is operated by the hand rope, the hight of the track above the floor is practically of no moment. For lines of track which intersect at any angle such that curves cannot be conveniently arranged to lead to a switch, a ball bearing turntable constructed and operated upon somewhat similar principles may be used. The turntable can accommodate a large number of lines of track converging to one point, and no curves are necessary.



A BALL BEARING SWITCH FOR OVERHEAD TROLLEY HOIST TRACKS.

These devices are used in connection with I-beam and hollow tracks. Flat or bar tracks require other styles of ball bearing switches, also built by the same makers, the New Jersey Foundry & Machine Company, 9-15 Murray street, New York.

The Detroit Testing Laboratory, under the management of W. P. Putnam, announce the opening of their business in the Union Trust Building, Detroit, Michigan, with a full equipment for the testing and assaying of ores, metals, water, fuel, cement and other materials. They are prepared to make both chemical and physical tests, as well as to furnish mixtures for all classes of foundry work, conduct boiler tests and the like; in short, to give the manufacturing industries of Detroit and surrounding cities the advantage of a testing laboratory similar in its scope and aim to those already organized in other large cities.

Mexican Railway and Industrial Notes.

Increased Tariff on Steel Products.

DURANGO, January 26, 1904.—It is a matter of current report that the Monterey Iron & Steel Company have petitioned the Government to increase the existing tariff duties upon such products as they manufacture, and in the sale of which they have to meet foreign competition in the domestic market. It is said that the higher duties asked for are to apply to steel rails, beams and merchant steel. The only authority at present for the statement that such application has been made is the daily press of the capital, in which the following item appeared a few days ago:

A director of the Monterey steel plant is authority for the statement that the Mexican Government, in response to a petition from the Monterey plant, will place a prohibitive tariff on certain classes of steel imports in order to protect the Mexican industry. Vicente Ferrari, president of the Monterey steel plant, is now in Mexico City conferring with Government officials relative to it, and it is known that his errand will be attended with success, though the amount of the new tariff over the present one is unknown, except that it will be so high as almost to forbid the importation of steel products into Mexico.

The works have been in operation about a year. The company have had time, therefore, to ascertain their ability or inability to manufacture and sell their products in competition with those of foreign makers. The application for higher duties upon imported steel seems to indicate that the works cannot compete with United States and European steel manufacturers under the tariff now prevailing. The fact that large quantities of steel rails and structural material are continually being brought into the country supports this view, in a measure, although it is not conclusive, since the demand for such manufactures is much greater than the works could possibly supply.

It being the policy of the Government to build up home industries by affording every reasonable means of encouragement to their founders, the protection asked for will very likely be given, and an early revision of the metal schedule of the tariff law is probable. The last amendments were made in 1901. An abstract, giving the rates upon iron and steel manufactures, appeared in *The Iron Age* of December 5 of that year. Under that decree, "rails, fishplates and spikes, points, ties and frogs, of iron or steel, for railroads," are admitted free, but upon "bar steel, round, square, flat, half round, octagonal or hexagonal," the rate of duty is 5 cents per gross kilo. On "steel in cylindrical, octagonal, hexagonal bars or T shaped, for use in mines," the duty is 1 cent per gross kilo; and "iron and steel goods, not otherwise specified," are assessed at 15 cents per legal kilo. Iron and steel braces for structures come in under a duty of 10 cents per legal kilo.

As previously announced, a heavy duty has been placed upon imported "dynamite and industrial explosives," in order to encourage their manufacture in Mexico, a factory having been established at Gomez Palacio, in this State. This precedent may be followed in the interest of the steel works at Monterey.

Railway Concessions and Construction.

The Mexican International Railway, which runs from Eagle Pass to Durango, will be extended, sooner or later, to Mazatlan. The company have applied for a concession to make this extension. The construction of this line to the Pacific coast was a cherished idea of the late C. P. Huntington, and it would doubtless have been completed before this had the great railway builder lived.

The reported sale of the Vera Cruz & Pacific Railway to a group of United States railway representatives, is positively denied by the general manager of the road.

Among the important railway extensions contemplated is that of the Chihuahua & Pacific, from Minaca to the Hearst timber lands, a distance of about 100 km.

Additional particulars, in relation to the concession obtained by Pedro Ruiz and Manuel L. de Guevara, for a railway from the Bay of Santecompar to the Tuxtlas, are given, from which it appears that surveys must begin within six months, and that at least 10 km. of the track must be constructed within two years; 10 km. more in the year following, and the entire road within four years from the date of the concession. It is to be a narrow gauge road. The concession carries the usual privileges in relation to the importation of construction material, &c.

It is reported that the International Railway Company purpose making an extension from Baroteran, between Sabinas and Monclova, to Santa Rosa, in the vicinity of the coal mines in the Menores district, owned by the Monterey Coal Company, the latter being an affiliation of the Monterey Iron & Steel Company.

John W. DeKay has obtained a concession to construct a standard gauge line, 80 km. in length, from Uruapam, in Michoacan, to Los Reyes, on the Mexican Central, in Jalisco. Steam or electric power may be used, and the construction is to be finished within three years. Mr. DeKay is connected with the United States Packing Company, whose plant is situated at Uruapam.

A company have been formed with $2,000,000 capital, under the style of the Mexican-American Company, of which E. H. Talbot is president, who purpose constructing two lines of electric railway, one between the city of Guadalajara and Lake Chapala, and the other between the same city and Morelia, Michoacan, the combined length of the tracks being about 250 miles.

The concession given some two or three years ago for the building of a road from San Juan Bautista to Tamulta, Tabasco, has been annulled.

Industrial Notes.

The law of December 14, 1893, under whose provisions new industries established in the republic enjoy a number of privileges, including that of tax exemption, has, by a recent decree, been extended to December 14, 1908.

A new steamship service is to be established between Mexican Pacific ports, the Hawaii Islands and Asia, under a contract made by the Government with John E. Bennett and M. F. Tarpey, dated December 19, 1903. The first steamer is to be put into service within a year from that date.

A shipment of zinc ore is to be made from a Mexican mine to Europe for treatment, this being the first instance of the kind. The reason given for the shipment is the fact that local smelters are not equipped for treating zinc ores, and are only able to concentrate them.

The Chicago Lumber Company and other concerns in the same line intend to erect saw mills in the State of Vera Cruz. A representative of the company named has been in Mexico making arrangements to carry out the plans. H. H. Ferdinan of St. Louis will also establish several saw mills upon the Isthmus of Tehuantepec.

The company who for two or three years past have been prospecting for petroleum near Tampico, and experimenting with such product as they have succeeded in finding, now announce that they "will soon be running their plant to its full capacity of 800 barrels per day, and distributing lubricating oil and asphalt throughout the country."

A foundry and machine shops are to be established by Señor Claudio J. Martinez, at Hornos, Coahuila, at a cost of $300,000. Orders for the equipment will soon be placed.

Mexican consuls abroad have been advised that invoices of merchandise consigned to "Port Stilwell," which are presented for certification, must be refused, there being no port of that name in Mexico. Topolobampo is the recognized designation of the port to which the unauthorized name refers.

Concessions for the utilization of water for irrigation and other purposes have been either obtained or applied for by the following named individuals, who will probably be in the market for piping and other material, or machinery. Fernando Gonzalez, to use the waters of the Amacusac River for the irrigation of the valleys of Iguala and Cocula, in the State of Guerrero; Theodore V. Peereboom and associates, to use 40,000 liters per second from the Janapa River, near Cordoba, Vera Cruz, for motive power; Charles Connant, to use 20,000 liters per second for irrigation, from the Yaqui River, in the district of Guaymas, Sonora; the Walthalla Colonization Company, who purpose constructing an irrigation

plant at a cost of $150,000, to flood a large area of agricultural land near Naranja, Jalisco; and Edward T. Le Clair, who desires to utilize, for motive power, 15,000 liters of water per second from the Rio Grande River, in the State of Chihuahua.

The death is announced of Thomas Ivey, at the age of 69. The deceased was for some years connected with the Victoria foundry, near Tulancingo, Puebla. He was a native of England.

In a quarrel with a former employee of the Meehan foundry, at Monterey, James Feeney, the superintendent, was fatally wounded a few days ago.

Machinery and piping will be required by Señor Ignacio de la Torre of the hacienda San Nicolas Peralta, who purposes the draining of a lake upon his property, situated on the Lerma River, 56 km. from the capital.

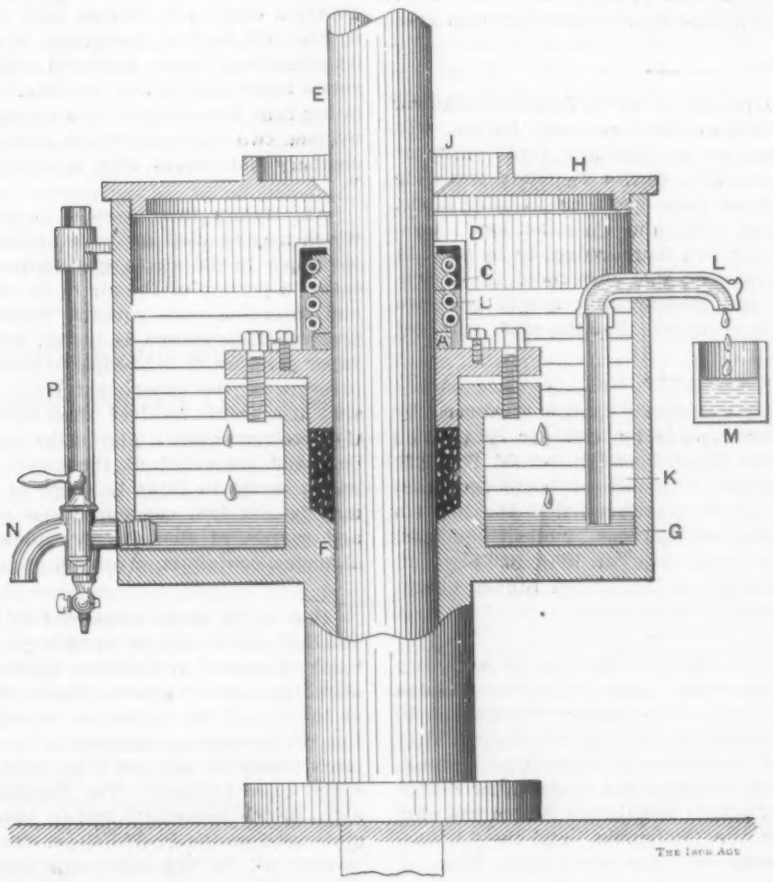
According to local reports, German concerns are securing many orders for structural steel for buildings to be erected in the city of Mexico.

The Knowles Steam Pump Company of Cambridge, Mass., are actively cultivating the republic for business, by means of traveling representatives. J. J. D.

The Brown Elevator Plunger Lubricator.

Hydraulic elevator plungers are by no means easy of lubrication, and as a consequence they frequently become pitted and scored, develop leaks and greatly decrease the life of the packing. We illustrate a lubricator which has been designed to obviate the difficulties stated and to minimize the attention which need be given to this feature of elevator practice. The lubricator is really made in combination with the plunger stuffing box, as shown in the engraving. The stuffing box is shown at F, and E is the plunger itself. Surrounding the stuffing box is an oil and water tight vessel, G, which may be provided with a cover, H, through which the plunger rod passes. The hole in the cover has its edges beveled, and the flange J surrounding the rod is provided so that leakage outward from the interior of the vessel or downward along the rod may be caught and returned to the interior.

Extending nearly to the bottom of the receiver is the tube K, connecting at its upper end to a spout, L. Water leaking through the stuffing box finds its way downward through the oil to the bottom, whence it will be forced upward through the tube K and out at the spout L, since the spout prevents the rise of level of the oil above that determined by its own hight. Since the tube K extends nearly to the bottom of the chamber no oil can escape so long as the depth of the oil itself is not sufficient to allow it to reach below the bottom of the tube K. The oil is thus preserved within the chamber, its upper level being maintained constant by the leakage of water through the stuffing box, the excess of water escaping freely to the exterior and being caught within the receptacle M, or otherwise disposed of. The receiver may also be provided with a drain cock, N, and a gauge glass, P, the former for emptying the receiver when desirable, and the latter to indicate at all times the approximate depth of liquid inside the receiver.



THE BROWN ELEVATOR PLUNGER LUBRICATOR.

The ring A is a solid piece loosely fitting the plunger. Rings B and C are adjustable, held in place by springs and serving as wipers both on the upward and downward strokes of the plunger. Their action, therefore, is to allow to adhere to the plunger only sufficient oil for proper lubrication and for keeping the stuffing box packing pliable and repellant of water. At D are adjustable attachments regulating the space between the rings on the upward stroke. Rings B and C are lifted by the plunger, allowing admission of oil beneath them; on the downward stroke the opening is closed to prevent the entrance of excess oil.

In starting to use the lubricator and in refilling it after it has been drained, water is first poured in to a depth sufficient to cover the lower end of the tube K, after which oil is poured in until its upper surface reaches the bottom of ring C. It is claimed by the makers that this lubricator will positively prevent scoring and pitting of the plunger, effect savings in power and oil, prevent leakage of water, increase the life as well as the efficiency of the packing, and require almost no attention. Lovegrove & Co., Incorporated, 143-145 North Third street, Philadelphia, Pa., are furnishing the Brown lubricator in various sizes for plungers of 3½ to 12 inches in diameter. Larger sizes may be supplied when required.

Scientific and Technical Notes.

According to figures recently published in Germany, the percentage of the population of the United States which is supported by agriculture is 36; that by mining and various industries, 24; that by trade and commerce, 16. As compared with these figures, we find those of Germany to be, respectively, 38, 37 and 11; those of England, 10, 57 and 11; those of France, 44, 34 and 9; those of Italy, 57, 28 and 4. This shows at once England's tremendous strength in manufacturing and weakness in agriculture. It also shows that in the continental European countries a larger proportion of the population is devoted to agriculture than in the United States, in spite of the fact that this country is the greatest agricultural nation in the world. The explanation is found in the fact that the efficiency of each rural worker in this country is far ahead of that of his European contemporary.

The new ship channel, known as the Ambrose Channel, which is the main entrance to New York harbor, will necessitate the excavation of 42,000,000 cubic yards of material. The channel will be 40 feet deep, 2000 feet wide and 7 miles long. At the lower end a cut is being made, 35 feet deep, 1000 feet wide, and 1½ miles long. Contracts have been let for two new dredges to be used in completing the main channel, and when these are in commission next spring the dredging output will be twice what it is now. It is estimated that the work will cost $24,000,000.

From 1897 to 1902 Germany's exports increased by 27 per cent., and her imports by 19.3 per cent. The total commerce of the Empire was increased 22.7 per cent., while the "adverse" balance of trade decreased by 8 per cent. It may be mentioned that the imports from America increased 37 per cent., while those from Europe increased only 11 per cent. In 1897, 10.5 per cent. of the total exports came to the United States, but in 1902 this figure was only 9.3 per cent.

Rear-Admiral George Wallace Melville is authority for the recent statement that there are in the Russian navy 11 ships fitted with triple screws; France has 10 battle ships and 19 cruisers of this type; Germany, after a competitive trial of the twin and triple screw systems, has practically decided to adopt the triple screw design in all her future war ships; the United States has only two cruisers so fitted, the "Columbia" and the "Minneapolis," and these were built ten years ago. Thus, of all the great naval powers, England is the only one which has no example of this form of propulsion, and England and the United States—the two great Anglo-Saxon nations—are the only ones not building triple screw ships for their navies.

It is estimated that the cotton spindles of the world now reach the vast total of 104,000,000; and the looms, 1,350,000. Of these, no less than 44,000,000 of the spindles and 650,000 looms are in Great Britain. To run these, the English import annually, at the average price of the last three years, in round figures, $175,000,000 worth of raw cotton; and it is estimated that the product of the spindles and looms brings in an annual average of $450,000,000; thus showing a balance of $275,000,000 to the credit of the process of manufacturing.

An estimate of the water powers developed in the several countries was given by A. Gradenwitz, in a paper before the Frankfort Congress of German Naturalists and Doctors. His figures are as follows: Germany and Austria, 180,000 horse-power; Switzerland, 160,000 horse-power; Sweden, 200,000 horse-power; the United States, 400,000 horse-power. He estimates the total power available in a number of countries to be: Sweden, 2,000,000 horse-power; France, 10,000,000 horse-power; Germany, Austria, Switzerland and Italy, combined, 10,000,000 horse-power; while in the United States, the Niagara Falls alone could furnish 10,000,000 horse-power.

A United States Treasury note measures 3⅛x7¼ inches. It will stand, without breaking, a weight of 41 pounds when the direction of the pull is lengthwise, and 91 pounds when crosswise. The notes are printed four on a sheet, the sheet being 8¼x13½ inches. The sheet will sustain, lengthwise, a weight of 108 pounds; crosswise, 177 pounds.

It is not generally known that many residences at Boise, Idaho, are heated by hot water obtained from a hot artesian well that has a temperature of 170 degrees. The water is piped from a point one mile from town, and loses only five degrees in transit.

One of the latest novelties in electric fans is the oscillating fan, which, instead of hurling its blast in one direction constantly, swings back and forth on an axis, so that its field of usefulness is greatly enlarged and its refreshing breeze scattered over a large area. This year's innovation is the "gyrofan," by which these oscillating fans are mounted on a ceiling bracket, and in this manner two of them can be made to sweep a room of ordinary dimensions with a steady current of air.

An Italian has invented a saturation hygrometer which may be used for determining the tension of aqueous vapor in the air in small spaces, such as instrument cases; a portion of the air to be examined is withdrawn and saturated with aqueous vapor and the increase in pressure thus caused is noted; knowing the saturation vapor pressure, it is possible to deduce the aqueous vapor pressure of the experimental air. The apparatus consists of a bronze receiver fitted with a thermometer; into the receiver passes a glass tube, drawn out at the lower end, and connected at the upper end with a syringe, which serves to force in drops of water. The receiver may be put into communication with the exterior air, and carries at the side a graduated tube of 3.2 mm. diameter, containing a column of petroleum 2.5 cm. long.

One of the latest industries to be established on the Pacific Coast is that of window-glass making. A factory has been opened at Stockton, California, which turns out about 45 tons of glass a week. Stockton was selected as the site of the factory on account of its natural position within easy communication by water with San Francisco, plenty of fuel and a specially good quality of sand found close at hand. The Stockton factory will probably, in the immediate future, supply the whole of the glass used on the Pacific slope. To-day it is hardly able to meet all the demands made upon it.

The ships employed in the foreign and domestic trade of the United Kingdom in 1902 included 6699 sailing ships of an aggregate tonnage of 1,745,732 (average, 260 tons), employing 44,179 in the crews; and 7727 steamships of a total of 8,059,969 tons (average, 1042 tons), employing 209,361 persons. In 1887 there were 12,694 sailing ships of an aggregate tonnage of 3,114,430 tons (average, 245 tons), employing 81,442 persons; and 5029 steamers of 4,009,324 tons (average, 796 tons), employing 121,101 persons. The increase in the average size of the ships will be noted; also the rapid displacement of sailing ships by steamers. The average crew of the sailing ship has increased from 6.4 men to 6.6; of the steamers, from 24.1 to 27.1, due doubtless to the increasing engine powers. The number of men in the crews for each 1000 tons has decreased in the sailing vessels from 26.1 to 25.3; and in the steamers from 29.6 to 26.

In the gun trials conducted by the Chilean Naval Commission, Messrs. Vickers Sons & Maxim have established a record in power for their 7.5-inch naval or coast defense guns. One of these guns, made for the new Chilean battle ship "Libertad" (which, by the way, has just been sold to England), developed, with its 200-pound projectile, a muzzle velocity of 3003 feet per second under normal conditions of pressure, showing a muzzle energy of 12,508 foot tons. In other words, it is claimed that

these guns, using capped shot of the Vickers pattern, can perforate the latest type of 6-inch armor at a range of between 3 and 4 miles.

In 1873 Mexico had 335 miles of railway, and the traffic over this mileage comprised 723,864 passengers, and 150,470 tons of freight, producing a revenue of $1,848,375. In 1900 the length of line in operation had grown to 8460 miles, the number of passengers carried was 10,709,462, and 7,522,923 tons of freight were moved, the revenue for the year being $49,425,478. The percentages gained in the 27 years are: Mileage, 2426; passengers, 1379; freight, 4899; revenue, 2574. The density of yearly passenger traffic has fallen from 2161 per mile in 1873 to 1266 in 1900; in the meanwhile, freight traffic has increased from 449 tons per mile to 890; and revenue from $5518 per mile to $5843.

One of the latest of the English submarine boats is known as "A1." She is much larger than the previous boats, and is expected to make a speed of 15 knots on the surface and 10 knots submerged. The most interesting fact about her is that she has no less than 16 cylinders to her motor. A four-cylinder motor car is not always an unmixed blessing, and submarines are by no means so far advanced as their shore going equivalents. A 16-cylinder motor car would be regarded with considerable terror by the majority of mechanicians.

The Anti-Injunction Bill.

Hearings by the House Judiciary Committee.

WASHINGTON, D. C., February 2, 1904.—The House Committee on the Judiciary has set February 24, 25 and 26 as dates for hearings for and against the so-called anti-injunction and anti-conspiracy bill, introduced by Representative Grosvenor of Ohio, and identical with the measure which passed the House in the last Congress, but which was abandoned by its advocates because of objectionable amendments added to the measure in the Senate Judiciary Committee. In view of the fact that the bill is soon to be discussed in detail, its text, which is very brief, will doubtless be read with interest. It provides as follows:

Be it enacted, &c., That no agreement, combination or contract by or between two or more persons to do or procure to be done, or not to do or procure not to be done, any act in contemplation or furtherance of any trade dispute between employers and employees in the District of Columbia, or in any Territory of the United States, or between employers and employees who may be engaged in trade or commerce between the several States, or between any Territory and another, or between any Territory or Territories and any State or States or the District of Columbia, or with foreign nations, or between the District of Columbia and any State or States or foreign nations shall be deemed criminal, nor shall those engaged therein be indictable or otherwise punishable for the crime of conspiracy, if such act committed by one person would not be punishable as a crime, nor shall such agreement, combination or contract be considered as in restraint of trade or commerce, nor shall any restraining order or injunction be issued with relation thereto. Nothing in this act shall exempt from punishment, otherwise than as herein excepted, any persons guilty of conspiracy for which punishment is now provided by any act of Congress, but such act of Congress shall, as to the agreements, combinations and contracts hereinbefore referred to, be construed as if this act were therein contained.

Employers Aroused.

The decision of the House Judiciary Committee to grant hearings on this measure represents an awakened public sentiment, in striking contrast to the indifference shown by manufacturers and other employers when this bill was taken up in the House in the last Congress. At that time the committee had before it a great mass of "machine made" petitions, representing the activity of the American Federation of Labor and subordinate labor organizations throughout the country urging the passage of the bill. Few employers were even aware of the fact that it was pending, the measure having been prepared at the instance of the American Federation of Labor, which promptly set in motion the machinery for working up a demand for Congressional action, while employers knew little or nothing of what was on foot. The result was that the bill was reported to the House and rushed through with very little debate.

When the measure reached the Senate, however, Senator Hoar insisted upon adding certain amendments narrowing the scope of the bill and modifying its revolutionary features to such an extent that President Gompers of the American Federation of Labor, in a letter to Senator Frye, President *pro tem.* of the Senate, said that "deeply affected as we are and earnest as is our purpose to have Congress pass such a law, the amendment proposed by the committee in its report is so subversive of the very purpose and principle for which the bill was drafted that we would much prefer the defeat of the entire measure should the objectionable amendments be retained therein." Mr. Gompers added that the amendment "not only vitiates the original purpose and intent of the bill, but supplies the statutory authority upon which injunctions may be issued *ad libitum*." Inasmuch as the Senate supported Senator Hoar in his contention that the bill ought not to pass except in the amended form, no further action was taken upon it.

Strong Protests Filed.

Early in the present session the bill was again brought forward, but no sooner had it been introduced than the employing interests began to be heard from in all parts of the country. The National Association of Manufacturers took the matter up vigorously, supplying its members with copies of the bill and pointing out the effects that would probably follow its passage. As a consequence of the attention thus given to the matter, the House Judiciary Committee up to the present time has received more than 200 remonstrances from well-known manufacturing concerns scattered throughout a score of States, while 20 members of the House have advised the committee of their desire to be heard in opposition to the measure before an attempt is made to report it. The general trend of remonstrances received by the committee is indicated by the following brief extract from the letter of a well-known Western manufacturer of machinery:

It is well known to employers of labor that many acts, comparatively harmless if committed by individuals acting singly, become highly dangerous to property rights and the general welfare if committed pursuant to agreements or conspiracies by or between a number of persons, and it is this fact that renders such combinations unlawful. As an eminent jurist has said, "Such combinations are said to be unlawful conspiracies, though the acts in themselves, and considered singly, are innocent, when the acts are done with malice—*i.e.*, with the intention to injure another without lawful excuse."

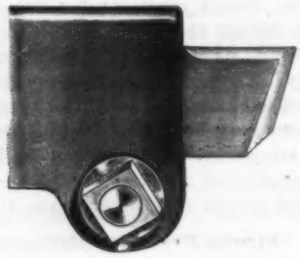
The law, as it now exists, renders criminal any conspiracies to prevent another from exercising a lawful trade or business by force, threats, intimidation or coercion. The proposed bill, if it becomes a law, will give free rein to the perpetration of acts which have heretofore been the subjects of legal restraint. It will render lawful, to the extent of the jurisdiction of Congress, boycotting, the picketing of struck plants, and general interference with the proper carrying on of all branches of industry, and will have the effect of defeating all efforts of employers of labor to conduct their establishments in accordance with correct business principles. The bill is in line with the efforts of organized labor, and all must realize without argument the danger involved by the proposed legislation.

As a result of the flood of such remonstrances which the committee has received, it has been decided, as above stated, to devote three days to hearing both sides of the case with regard to this measure. President Gompers and the members of the Legislative Committee of the American Federation of Labor will open and close the arguments in favor of the bill, but the opponents of the measure will be given ample time to express their views. Persons interested for or against the bill who cannot be present at the hearing will be permitted to appear by attorney or to file written arguments. W. L. C.

The Pittsburgh, Fort Wayne & Chicago Railway have finally agreed to accept the conditions laid down by the City Council of Chicago, in its mandatory ordinance for track elevation. Many miles of track will be elevated, not only by this road, but by the Chicago, Burlington & Quincy, the Chicago & Northwestern, the Chicago Terminal Transfer and Grand Trunk roads, and an effort is being made also to compel the Illinois Central road to elevate its tracks through Kensington, a suburb in the city limits.

The Armstrong Lathe and Planer Side Tools.

These tools are made with both straight shanks or offset shanks in a variety of sizes. The cutters are of self hardening steel, believed to be of the proper size and design to withstand the heavy stresses imposed by modern machine shop practice. The cutters are held securely, the holder grasping them very close to the cutting end, thus affording them good support and also enabling them to be used up very short. The holder is drop forged from steel and is case hardened. The manufacturers are the



Straight Shank Side Tool.

Right and Left Hand Offset Side Tools.

Right and Left Hand Straight Shank Side Tools.

THE ARMSTRONG LATHE AND PLANER SIDE TOOLS.

Armstrong Brothers Tool Company, Chicago, by whom it is claimed that the tools will do as heavy work as any solid forged tools of corresponding sizes.

A press dispatch from St. Petersburgh, dated January 27, states that the Russian Government has given orders that in future no locomotives are to be imported, but must all be made within the Empire. American locomotive builders, familiar with Russian affairs, say that the Russian locomotive plants are not large, and the maximum capacity is not over 800 or 1000 a year. If Russia should suddenly require any large addition to its motive power on short notice, it could not itself fill the bill and would have to invite tenders from outside builders, and in that case the American locomotive builders would have an opportunity to compete.

Henry A. Hitner's Sons of Philadelphia, have just completed their new plant for handling all kinds of scrap iron and steel, especially car wheels on axles, large annealing boxes from plate mills, galvanizing kettles, still bottoms, heavy castings and rolls, old boilers, uncut; heavy shafting, salamanders, anchors, propellers, armor plate, cannon, iron and steel boiler plate, structural material of all kinds from fires. They are also dismantlers of viaducts, buildings, bridges, steamships, &c.

New Publications.

THE POLAR PLANIMETER, AND ITS USE IN ENGINEERING CALCULATIONS. By J. Y. Wheatley, C.E. 114 pages, 6 x 9 inches, and 12 folding plates. Cloth Boards. Illustrated. Published by the Keuffel & Esser Company, 127 Fulton street, New York. Price, $3.

The author in his preface states that his reason for preparing the work in question was the unsatisfactory result of his own experience in attempting to learn the use of the planimeter from the inadequate "Directions for Use" supplied with the instrument. The inability to find a satisfactory treatise upon the subject led to a personal investigation of the theory of the instrument, and this to an extended study of its field of usefulness. The results of his study have been placed in this book form, including a very lucid explanation of the theory. The value of the planimeter in engineering calculations is shown by the successive chapters of the book, and is shown to be greater than is commonly understood. The possessor of the instrument after a careful perusal of Mr. Wheatley's work should be able to greatly facilitate computations in nearly all lines of engineering work. Tables, diagrams and factors are given by way of contributing to ease and rapidity of use of the planimeter and of arriving at the definite results sought.

A MANUAL OF MECHANICAL DRAWING. By Philip D. Johnston. 65 pages, 9¼ x 7¼ inches, and two folding plates. Novelty Cloth Boards. 134 illustrations. Published by the David Williams Company, 232-238 William street, New York. Price, $2.

Mr. Johnston is the superintendent and mechanical engineer of the West Point Foundry, and has had the long experience both as a draftsman, engineer and instructor in mechanics to make him peculiarly well qualified to realize what is best in mechanical drawing practice, and thoroughly competent to prepare a work for the guidance of students of the subject. The aim has been to combine accuracy with modern progressive methods and approved systems, so as to place within the reach of the student a source whence he may derive a practical ground work upon which he may place dependence as to its conformity to modern drawing room practice. Starting with entirely elementary matters, such as general geometric definitions, illustrated by diagrams, the subject is progressively treated, using in all cases examples of most practical nature, and finally reaching the higher grades of work which may be expected of the mechanical draftsman. All attempts at combining with the essentials of drawing itself more than the merest rudiments of machine design are very sensibly omitted. The aim of the work is to assist, so far as is possible, the process of attainment of proficiency as a simple draftsman, leaving the matter of engineering calculations for intelligent design to be derived from independent sources.

REINFORCED CONCRETE. By Armand Considere. Translated by Leon S. Moisseiff, C.E. 188 pages, 6 x 9 inches. Cloth Boards. Illustrated. Published by the McGraw Publishing Company, 114 Liberty street, New York. Price, $2.

This work presents essentially a compilation of reports of experiments conducted by the author with a view to determining data from which to derive laws and formulas relative to the properties of reinforced concrete. The experiments reported cover a period of four years, and were evidently of a very exhaustive nature. The extensive use of reinforcement in concrete structures, so as to bring this material within a field of application more nearly approaching that of other building materials, has led to the derivation of various rational yet empirical formulas based quite generally upon the assumed analogy between the action of reinforcing bars in concrete to that of similar rods used in connection with timber construction. These empirical formulas, although useful and sufficiently accurate for types of construction wherein similarity in form and nature of stresses exists between the concrete and simple timber construction, do not follow when special and peculiar forms of work, to which the

new material is peculiarly adapted, are entered upon. The seven publications of the author form the titles of the seven chapters in his book. The first chapter deals with "Reinforced Concrete in Bending," and discusses the various phases of the subject, including the influence of reinforcing on concrete, the resistance and elasticity of the materials used, the influence of the proportions of reinforcing used and of the quality of the materials, costs of different types of beams and their action under different kinds of loading, &c. Chapter II has for its subject, "The Deformation and Tests of Reinforced Concrete Beams," and in it the laws of deformation of concrete in compression and under tension, the effect of repeated stresses, and various other phases of the question are considered. Chapters III to VI, inclusive, deal respectively with "Effects of Changes in Volume of the Concrete," "Tensile and Compressive Resistance of Reinforced Concrete to Shearing and Sliding," "Effect of Cracks on Stresses and Deformations." In Chapter VII extended consideration is given to "The Compressive Resistance of Reinforced and Hooped Concrete." In this chapter are recorded the results of experimental research, the general properties of hooped concrete construction, with practical rules for its computation, &c.

FRICTION AND LOST WORK IN MACHINERY AND MILL WORK. By the late Robert H. Thurston, M.A., LL.D. Seventh Edition, Revised. 425 pages, 6 x 9 inches. Cloth Boards. Illustrated. Published by John Wiley & Sons, New York. Price, $3.

Professor Thurston's treatise upon the subject of friction and lubrication of machinery has had so great a sale that the sixth edition was exhausted and a seventh made necessary. In preparing this latest edition, the author took occasion to insert considerable new matter with a view to bringing the book quite up to date. The added matter increases the number of pages by about 40. The new conditions imposed by developments of modern steam engine practice, involving the use of units of large size and capacity and driving generators of corresponding dimensions, are such that the highest state of the art of lubrication demanded revision of older methods of treating the subject. This requirement Professor Thurston has endeavored to meet, adding the new data to his standard work upon the subject. Chapter VII of the book deals particularly with the advances of modern practice and the influences which should govern the selection of lubricating materials and the adoption of effective systems for distribution and application thereof.

Low Prices on Tires.—CHICAGO, ILL., February 2, 1904.—The manufacturers of locomotive tires, namely, the Midvale Steel Company, Nicetown, Pa.; the Latrobe Steel & Coupler Company, Philadelphia, and the Standard Steel Company, Philadelphia, are now in the midst of intense competition for business. Orders have recently been taken by all of these firms for delivery at Minneapolis, St. Paul, Omaha and Kansas City, at 2½ cents per pound, delivered. This means that these firms will deliver the steel to the locomotive works, wherever they are, and pay the freight on the steel tires in the locomotive from the locomotive works to the point of destination for 2½ cents per pound, netting them from 2 to 2¼ cents at the mill, according to freight distance. These prices are for open hearth steel tires. Frederick Krupp, the German iron master, is selling some crucible steel tires in this country at 7 cents per pound, delivered at the locomotive works, but the extremely low prices now made, as above outlined, have practically shut off German competition. Extremely low prices are also being made on steel springs and axles.

One reason for the holding off of the New England railroads from placing orders for new rails is the condition of the market for rails for relaying. There is literally no one buying old rails in Boston, at any price, and the railroads no longer have use for them for their own purposes. Two years ago, when new yards were being established, they took care of hundreds of miles of rails for relaying. Street railways were buying these rails, but modern street railway practice, coupled with the insistence of city and town authorities that girder rails be used in the streets, have cut off most of this demand. It is no longer considered economical to buy second-hand rails for electric railroads over private right of way, because the demand of modern interurban and suburban traffic is for heavy cars and high speeds, which mean too great wear and tear for anything but new rails. Rerolled rails are no longer sought as they used to be. So the railroads see no market for their rails for relaying and do not care to buy new rails, excepting where it is absolutely necessary, at any rate at the present price of $28.

The Pittsburgh Foundrymen's Association.

The regular monthly meeting of the Pittsburgh Foundrymen's Association was held in the rooms of the Engineers' Society, 410 Penn avenue, Pittsburgh, on Monday evening, February 1. F. L. Slocum was president and F. H. Zimmers, secretary. The meeting was largely attended, over 50 foundry concerns in the Pittsburgh district being represented and came to the meeting for the purpose of hearing the address of Arthur Hamerschlag, director of the Carnegie Technical Schools, now building at Pittsburgh, his subject being "What the Carnegie Technical Schools are going to do for the Foundry Interests of Pittsburgh and vicinity." Mr. Hamerschlag addressed the meeting for fully an hour, and set forth very clearly in his remarks the scope and purpose of the Carnegie Technical Schools, and prefaced his remarks by stating that he wished to correct the false impression which seems to have gone out, in regard to the purpose and work of these schools. He stated, in referring to the foundry interests, that it was not the purpose of the Carnegie schools to take a man in as a pupil and make a finished molder of him. On the other hand, it would be the purpose to take a man either totally unfamiliar with the foundry business, or a molder, if you will, and give him knowledge of the foundry business, which he could not acquire in the foundry business itself. It is the idea to have graded classes, the lowest for beginners and the highest for foremen and engineers connected with the foundry trade, and have these classes in charge of competent instructors who would be able to impart knowledge to those who attended them. Mr. Hamerschlag suggested that the Pittsburgh Foundrymen's Association should appoint a standing committee for the purpose of having this committee confer with him as to the best needs of the institute and to give him suggestions as to the line of work to be followed out. It is the intention to charge a nominal tuition fee for pupils in these schools who come from Pittsburgh and vicinity, while a higher rate will be charged for pupils living outside Allegheny County. Mr. Hamerschlag's address was exceedingly interesting, and he was listened to with close attention.

A paper on the "Manufacture of Steel Castings" was read by L. L. Knox of Pittsburgh. Considerable discussion followed the reading of Mr. Knox's paper, and was confined largely to the question as to whether basic open hearth or acid open hearth castings were the better. Some of the foundrymen present contended that just as good castings could be made from basic open hearth steel as from acid open hearth steel, while others took the other view. The discussion was quite generally participated in and brought out a good deal of interesting information as to the experience of different foundries in the Pittsburgh district in the manufacture of both basic and acid castings. Among those present at the meeting were the following: J. S. Seaman, Seaman-Sleeth Company; F. H. Zimmers, Union Foundry & Machine Company; Elliot Kebler, Mathew, Addy & Co.; W. J. Carlin, Thomas Carlin's Sons Company; D. B. Fuller, Westinghouse Electric & Mfg. Company; Samuel W. Hay, Whiting Foundry & Equipment Company; J. H. Hillman, Jr., J. H. Hillman & Son; A. O. Backert, *Iron Trade Review;* J. R. Thomas, Sterritt & Thomas; S. D. Sleeth, Westinghouse Air Brake Company; Robert A. Walker, *The Iron Age*, and about 40 others. The paper for the meeting on March 7 will be read by Thomas D. West of the Thomas D. West Foundry Company, Sharpsville, Pa.

The Iron Age

New York, Thursday, February 4, 1904.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - - ASSOCIATE EDITOR.
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - - - BUSINESS MANAGER.

The Iron Age Index.

The index to the reading matter of Volume 72 of *The Iron Age*, for June 30 to December 31, 1903, has been compiled and printed, and will be mailed to those subscribers of *The Iron Age* who will make application for it.

In order to relieve those who bind or file *The Iron Age* of the trouble of future applications for the semiannual Index, we have a special list to whom the Index is forwarded without further notice. Subscribers who desire to be entered upon that list will kindly so advise us.

Our Consumption of Iron and Steel.

The publication of the official statistics of the production of pig iron by the American Iron and Steel Association, and of the imports and exports of iron and steel by the Bureau of Statistics, permits a presentation of approximate figures relating to our home consumption of iron and steel, which, after all, is the great regulator of prices and the basis of our prosperity.

The data relating to pig iron are summarized in the following table, which presents the figures relating to the period which followed the panic year of 1893, the first column giving the production of pig iron and the second the apparent home consumption, taking in the imports and exports and the increase and decrease of unsold stocks. The latter are those of the American Iron and Steel Association, which do not take into account the stocks in the hands of steel works and puddle mills, or those which have passed out of the possession of the producers. It is probable that if they were known they would, to a very moderate degree, attenuate the violent fluctuations:

Production and Apparent Home Consumption of Pig Iron.

Year.	Production. Gross tons.	Home consumption. Gross tons.
1894	6,657,388	6,694,302
1895	9,446,308	9,628,362
1896	8,623,127	8,276,175
1897	9,652,680	9,381,000
1898	11,773,934	12,005,058
1899	13,620,703	13,660,226
1900	13,789,242	13,176,083
1901	15,878,354	16,231,829
1902	17,821,307	18,439,899
1903	18,009,252	18,039,907

Three periods may be clearly distinguished, that of the years 1895 to 1897, inclusive, when the consumption was proceeding at the rate of a little over 9,000,000 tons per annum; that of 1898 to 1900, inclusive, with an average of nearly 13,000,000 tons, and that of 1901 to 1903, inclusive, when it was over 17,500,000 tons annually, reaching the enormous rate of 20,000,000 tons per annum during the first half of 1903, from which it dropped to a 16,000,000-ton rate during the second half, and to the extraordinary slump in December of a little less than an 11,000,000-ton rate.

The really astounding fact, which cannot be too urgently impressed upon those connected with the iron and allied industries, is the amazing growth in the consumption in such a short space of years. We may suffer temporary reverses, as we are now doing, when a rate of consumption of pig iron of 1,000,000 tons per month seems to us so alarming. Yet it is all that we attained as a record as recently as 1898. A glance at the figures is all that is needed to convince any one who has even a faint appreciation of the magnitude of our resources that a year, at most, must see us again at work pushing toward a new record.

Statistics based upon the movement of pig iron must, of course, be accepted with reserve as reflecting accurately our home consumption of iron and steel. They, of course, ignore consumers' stock of pig iron, the home stocks of finished iron and steel in all the different forms, and the imports and exports of finished iron and steel. For these we possess the tonnage figures for only a limited number of products, and even so far as they are concerned we ought to make allowance for waste in manufacturing in order to get down to a common pig iron basis, ignoring altogether the use of old material and of scrap. Still, rough as is a method so hedged in by allowances, it does, we believe, furnish an even truer reflection of the true state of affairs than a computation based simply upon pig iron.

We have compiled the following table by adding to the apparent home consumption of pig iron the net imports of finished iron and steel, and deducting the net exports thereof. These net figures are arrived at by eliminating the figures for pig iron already taken account of and also those of old material and scrap. It has been necessary to ignore the re-exports, in finished form, of raw material imported under the drawback system, which really is important only in the case of tin plate. This would tend to make the fluctuations less pronounced:

Home Consumption of Iron and Steel.—Gross Tons.

Year.	Net imports.	Net exports.	Estimated consumption of iron.
1894	251,328	43,884	6,901,746
1895	318,910	63,225	9,884,047
1896	199,978	141,276	8,334,877
1897	137,073	311,350	9,206,723
1898	117,675	533,704	11,589,029
1899	121,456	637,350	13,144,332
1900	122,959	818,255	12,480,787
1901	138,232	605,447	15,764,614
1902	477,946	333,907	18,917,845
1903	496,301	298,240	18,237,968

A comparison of this set of figures with the series relating to pig iron alone shows that consumption during 1902 was really greater. It emphasizes the falling off in 1903, but on the whole indicates, as might be expected, a less erratic course. It furnishes, however, even more striking evidence of the enormous growth in the requirements of this country and our dependence upon our home markets.

The Uprising Against Union Methods.

We are passing through a period bristling with important occurrences in labor matters. The past year witnessed a remarkable upheaval of antagonism to the onward march of organized labor. In a number of important cities an actual revolution took place in the building trades which have been the bulwark of the unions. Building contractors, who have hitherto been the most yielding of all employers, have shaken off their timidity, banded themselves for mutual defense and have successfully fought further aggression on their rights as employers. Walking delegates have been shorn of their autocratic powers and blackmailers among them have come to grief, some now wearing convicts' stripes. All over the country associations of citizens and employers have been formed for the purpose of enforcing the

laws, suppressing violence during strikes and defending independent workmen in their right to earn a living. Governors, mayors and sheriffs have shown a stronger disposition to adopt stern measures for the maintenance of order in times of labor troubles, instead of winking at riotous outbreaks and currying favor with the labor vote. Large employers of labor announce that they will no longer enter into agreements with their men, binding themselves to pay certain rates of wages, or to run their factories for a stipulated number of hours per day for a fixed period.

A revolution in public sentiment has occurred which must shortly impress itself upon labor leaders, if it has not already done so. This is particularly noteworthy in localities which have long been strongholds of unionism. In the city of Chicago, for example, unionism has run riot. There the attempt to preserve order during a strike has been pitiably weak, and employers have felt that they were contending with the united forces of the strikers and the city authorities. But public sentiment has been aroused in Chicago as elsewhere, and so great is the indignation against union methods that radical measures are contemplated. A grand jury has taken up the investigation of labor union methods in connection with recent disturbances. It has not only found a dozen indictments against union members, but proposes to go behind them to their principals. Demands have been made for the books and other documents of the Chicago Federation of Labor for the purpose of ascertaining whether the officials of that organization have given approval of violence. It has been held that these officials can be prosecuted under the same laws through whose provisions the anarchists were convicted in 1887. The opinion is held that labor chiefs, who by their speeches and writings inspire hatred for the employing class, can be made responsible if their teaching causes any of their followers to commit illegal acts. Such action on the part of a grand jury indicates that the slow moving but irresistible force of the public conscience has at last been aroused to a true conception of the gravity of the situation.

This awakening of the public to the dangerous aggressions of organized labor is one of the most remarkable developments of the time. It is, of course, a natural result of the militant spirit of the labor leaders, encouraged by a long period of success to believe that everything is possible to those who are thoroughly organized. Until quite recently the preponderance of public sympathy was clearly with organized labor, as it seemed that the movement to secure better pay and shorter hours was not unreasonable and such objects were to be attained only through organization. Men of keen vision perceived the danger that in time the liberty of the citizen would be curtailed to an extent incompatible with our free institutions, but their opposition was futile. The movement had not gone far enough to make others than employers feel apprehension. Possibly the awakenening would not have come when it did but for the fatuity of the labor organizations in resorting to acts of violence in even petty strikes, supporting their walking delegates in blackmailing employers, and through sympathetic strikes and boycotts disarranging the affairs of entire communities and subjecting everybody to serious inconvenience until the settlement of the primary cause of the trouble. The sense of justice has been so outraged that such palliatives as arbitration and conciliation are fast being relegated to the limbo of the "tried and found wanting." Speaking recently of the relations of employers and employees, Judge Grosscup of the United States Circuit Court at Chicago, is thus quoted:

> It has come to pass that, instead of peace, the standing relation between them is that of war. They look upon each other, not as neighbors or copartners, but as belligerents. When a truce comes and indemnity is laid it falls, not on the belligerents, but on the outside public—the great neutral who, up to that time, supposed it had only a moral interest in the conflict. The employer deals in this day, not with men, but with republics of men; not with individuals, but with governments, self constructed governments, inside the greater government called the State. Employment of labor is no longer a matter of bargain and contract; it is a matter for treaty, for diplomacy, or for war.

This is the view taken by one who is thoroughly unbiased, occupying a judicial position which makes him completely impartial. In the light of the new developments, however, these "self constructed governments inside the greater government called the State" are being brought to book for the misuse of their power and their mischievous tendencies are being checked. Those who have been dreaming of a day when organized labor will rule this country are learning that public sentiment is a greater power than brute force.

Our Imports and Exports of Iron and Steel.

The report of the Bureau of Statistics for December shows the following imports of iron and steel, so far as tonnage figures are given:

Imports of Iron and Steel.

Commodities.	Twelve months, 1903. Gross tons.	Twelve months, 1902. Gross tons.
Pig iron	599,574	625,383
Scrap	82,941	109,510
Bar iron	43,269	28,844
Rails	95,555	63,522
Hoop, band and scroll	1,525	3,362
Billets, slabs, bars, &c., steel in forms n.e.s	261,559	289,318
Sheets and plates	11,691	7,156
Tin plates and terne plates	47,360	60,115
Wire rods	20,836	21,382
Wire and articles made from	5,018	3,468
Structural iron and steel*	8,865	.....
Chains	373	576
Anvils	250	203
Totals	1,178,816	1,212,839

* Included in "All other" prior to July 1, 1903.

The exports are reported as follows for the years 1903 and 1902, there being included in the table only the figures for which weights are reported:

Exports of Iron and Steel.

Commodities.	Twelve months, 1903. Gross tons.	Twelve months, 1902. Gross tons.
Pig iron	20,381	27,487
Scrap	8,034	9,411
Bar iron	19,380	22,249
Wire rods	22,449	24,613
Steel bars	17,802	9,300
Billets, ingots, blooms	5,445	2,409
Hoop, band, scroll	2,141	1,674
Iron rails	181	211
Steel rails	30,656	67,455
Iron sheets and plates	4,782	3,434
Steel sheets and plates	13,242	14,866
Tin plates and terne plates	292	1,565
Structural iron and steel	30,641	53,859
Wire	108,520	97,843
Cut nails	8,890	7,198
Wire nails	31,498	26,580
All other, including tacks	2,321	2,244
Totals	326,655	372,398

It is clear that the export sales made during the last two or three months of 1903 have not yet been reflected in shipments.

The Amsler Engineering Company.—The Amsler Engineering Company of Pittsburgh have been organized with a capital of $50,000, and will carry on the business of engineers and contractors for the erection of blast, heating, open-hearth and glass furnaces. They will also do concrete and brick work and general contracting. The new company have a contract for the erection of a blast furnace for the American Steel & Wire Company, at

Cleveland, Ohio. W. C. Amsler is president and A. C. Davis, formerly of the Forter-Miller Engineering Company, is treasurer. B. F. Martin, a well-known glass furnace builder, is also connected with the new concern.

Notes from Great Britain.

The Markets.

LONDON, January 23, 1904.—Both makers and consumers have got into their stride again, and there is a fair degree of activity. So far as employment is concerned, the present period is not dissimilar from January of last year. Consumers are restricting purchases as much as possible, just as they did last year, but the aggregate of small orders keeps works steadily employed. Prices are unmistakably on a much lower level; hence many lamentations. On the other hand, it must be remembered that the cost of production is less, owing to the cheapening of raw materials. Still, making due allowance for this, iron and steel makers have quite convinced themselves that they are securing no adequate return. During the last week less has been heard of foreign competition in steel. British steel can now be obtained at 85 shillings. German steel is temporarily off the market. Quotations for German steel made last Thursday were at 86 shillings, which, of course, means that at the moment the Germans have got as many orders on hand as they can deliver. Buyers, however, are still pushing hard for concessions. Standard prices are:

Pig Iron: Scotch warrants, 49 shillings 6 pence; Middlesbrough, 41 shillings 9 pence. Forge qualities: Staffordshire cinder, 47 shillings 6 pence; part mine, 47 shillings 6 pence to 48 shillings 6 pence; all mine, 60 to 65 shillings; best all mine, 75 to 80 shillings; cold blast, 95 to 100 shillings; Northamptonshire, 45 shillings to 47 shillings 6 pence; Derbyshire, 47 to 48 shillings; North Staffordshire, 48 to 49 shillings; Lincolnshire, 50 shillings 1 penny.

Public stores stocks, January 21:

	Tons.
Connal's, at Glasgow	9,200
Connal's, at Middlesbrough	102,517
Connal's, at Middlesbrough, hematite	300
Hematite, West Coast	21,538

Finished Iron: Marked bars, £8; Earl of Dudley's brand, £8 12s. 6d., second grade, £7; common unmarked bars, £6 to £6 5s.; North Staffordshire bars, £6 10s. to £6 12s. 6d.; angles, £6 15s. to £7; sheets, singles, £6 10s. to £6 12s. 6d., doubles, £6 12s. 6d. to £6 15s., trebles, £7 5s. to £7 7s. 6d.; galvanized corrugated sheets, f.o.b. Liverpool, £10 10s.; hoop iron, £6 17s. 6d. to £7 2s. 6d.; nail rod and rivet iron, £6 12s. 6d. to £6 15s.; gas strip, £6 2s. 6d. to £6 5s.

Steel: Bessemer billets, £4 5s. to £4 7s. 6d.; Siemens billets, £4 10s. to £4 15s.; mild bars, £6 to £6 5s.; girder plates, £5 17s. 6d. to £6; boiler plates, £6 15s. to £7 5s.; girders, £5 15s. to £6 5s.; angles, £5 5s. to £5 12s. 6d.

Opposition to a Proposed Amalgamation.

The hostility to the amalgamation of the South Durham Iron & Steel Company, Limited, with the Cargo Fleet Iron & Steel Company, Limited, has assumed another phase. Though the shareholders, by a large majority, have indorsed the scheme, a requisition signed by preference shareholders, and representing a sufficient amount of capital for the purpose, had been forwarded to the secretary of the South Durham Company asking that an extraordinary meeting of the shareholders should be called to reconsider the matter.

German Iron in America.

A syndicate of German iron and steel masters have made arrangements for the starting of an agency in the United States for the disposal of their manufactures. The purpose of this step is not only to advance the sale of German goods in the United States, but to counteract the dumping of American surplus products in Germany, where they are being increasingly bought, the hostile tariffs against them notwithstanding.

Dumping Steel and Iron.

A representative meeting of forge masters and iron masters was held last Monday, at Leeds, to discuss the condition of things brought about by the dumping of German steel forgings in Great Britain. Each representative had been requested to bring with him statistics as to the decrease in output at his particular works, between the years 1898 and 1903, and also the number of hammers and men he had laid off during that period owing to scarcity of orders caused by foreign competition. The conference decided to appoint a committee to collect statistics and lay them before a meeting to be held about a month hence. It was evident from the sense of the meeting that some steps ought to be taken, at the earliest possible time, to devise some measures to arrest the dumping process, which was described as intolerable. It was pointed out by some of the speakers that steel and iron from Germany and the United States were placed upon the British market at lower prices than they could be produced in this country, and that this was a state of things which ought not to be allowed to exist. Meanwhile the forgemasters will await the report of the commission before taking further action.

British Tin Plates in Germany.

The question of the large imports of British-made tinplates into Germany is to be brought before the German Imperial Home Office Commission on the working operations of syndicates by the tinplate consumers in that country for the purpose of partly illustrating their opposition to the tactics of the German Tinplate Syndicate, which is the oldest combination in Germany. At the present time there are in Germany approximately 500 firms which work up tinplates, and in 1903 these formed an association for the protection of their interests. A few days ago the representatives of the associated consumers in Berlin and approved the text of a petition for presentation to the commission. At the same time the preliminary results of an inquiry, which is being undertaken by Dr. Wendlandt (secretary of the association), were submitted, showing that of the total tonnage of tinplates used by the works which have so far made returns, no less than 60 per cent. is obtained from Great Britain. The attitude of the German tinplate syndicate toward native consumers is described as being so arbitrary that the latter have decided to perfect their arrangements for the import of British tinplates. The German tinplate syndicate is reported not to be by any means in a position to meet the inland demand.

A Grand Trunk Order.

The Grand Trunk Railway Company have placed orders with the Barrow Steel Company and with Cammell & Co. of Workington for 15,000 tons of steel rails for early delivery, and the same firms have jointly received orders for 12,000 tons of steel rails for the Canadian Pacific Railway Company. Keen competition was experienced for these orders, and the price at which deliveries have been arranged is consequently low—viz., £4 12s. 6d. per ton, f.o.b. The rail mills at Barrow, which have been stopped for a month, are starting next Monday morning, with prospects of better employment.

A Big Undertaking.

Structural steel manufacturers will be interested to hear that the southwest of Russia Railway Company, together with the Chief Administration of Commercial Navigation, are about to erect in Odessa grain elevators of 400,000 tons capacity, at an estimated cost of 5,000,000 roubles.

Shipbuilding Notes.

The Japanese Minister of Marine this week cabled instructions to his ambassador in London to sign contracts with the Vickers-Maxim Company and with the Armstrong firm for one battle ship from the works of each company, and to be delivered in 18 months. These vessels will be 16,400 tons, and, following the lines of the "Mikasa," designed and built by Vickers, will be the most heavily armed ships in the world, important gun innovations being introduced.

One of the small details of design bearing directly upon the efficiency of all boilers, but particularly of those of the water tube type, is the ratio of the grate to the heating surface, and at Yarrow's works there have been several experiments on this question with a boiler equal to 1200 indicated horse-power. This boiler had 1008 tubes, each 1¾ inches outside diameter, with an average length of 6 feet 9¼ inches. The first test was con-

ducted with a grate having 53 square feet of surface, and with 3217 square feet of heating surface, giving a ratio of 1 to 60.7, while in the second test the grate was reduced to 40 square feet, with a slight change in the heating surface, giving a ratio of 1 to 78.2. The results showed that there was a much higher evaporative efficiency with the smaller grate, each pound of fuel consumed giving with the small grate 10.57 pounds of steam, whereas in the other test it only gave 9.96 pounds. At the same time it was decided that, irrespective of this, the same boiler should give an equal volume of steam, and thus the quantity of coal consumed per square foot of grate had to be increased. Thus with the larger grate the rate was 29.7 pounds of fuel, and with the less area 39.31 pounds. To burn the greater quantity more draft was required, 0.75 inch, as compared with 0.56 inch. The greater efficiency of the small grate would materially reduce the coal bill in the large ship, and thus the results are of first importance. The reason offered in explanation of the result of the more intense combustion is that the gases are burnt more quickly, and are not so likely to come into contact with the cold surface of the tubes in an unburnt state, the cold surface tending to extinguish the flame in the same manner as the wire gauze which surrounds a Davy lamp. The smaller grate is more convenient for stoking, and moreover the area of the boiler compartment for a given power can be reduced.

The first of the new Atlantic turbine steamers, named the "Victorian," is now well advanced in the yard of Workman, Clark & Co. in Belfast. She is expected to be ready for her station in the autumn of this year. Charles Parsons, so well known in connection with turbine inventions, has devised many modifications of his earlier designs to suit Atlantic requirements. Great power will be attained both for forward and backward movement; it will be transmitted through shafting, and by means of propellers of special strength and design, run at a speed moderated to the conditions of Atlantic work, and contrived to give steady efficiency without undue strain, and free from all vibratory disturbances. S. G. H.

The Warwick Iron & Steel Company.

The following report of the Warwick Iron & Steel Company of Pottstown, Pa., signed by Edgar S. Cook, president, and the Board of Directors, will be read with interest, since the plant is one of the most modern and best managed works in the East:

Our product of pig iron for 1903 was 173,115½ tons, as compared with 147,118 tons for 1902. No. 1 furnace was blown out the early part of October. This action was deemed advisable, owing to the almost total stoppage of work by the steel mills and rolling mills, and the consequent accumulation of pig iron in furnace yard. The operation of No. 1 furnace was, therefore, limited to nine (9) months, the product being 39,096 tons. No. 2 furnace made 134,019½ tons. A total of 173,115½ tons. The net earnings for the first half of 1903 aggregated $109,753.81. The net earnings for the last half of 1903 fell to $37,441.18, making a total for the year of $147,194.99.

The reaction in demand for iron of all grades began to be experienced in the early Summer months. Prices weakened, and then commenced falling at a rapid rate, until the market prices reached a level considerably below the cost of manufacture. At the same time difficulty was experienced in obtaining shipping instructions on orders entered previously. Under all the adverse circumstances, it is a matter of some little congratulation, at least, that the result for last half of the year shows any profit.

No. 1 furnace is now being relined, and will not be ready for operating, even if desired, before March 1. Up to January 2, 1904, No. 2 furnace has made a total of 266,719 tons of iron, or an average of about 2,280 tons a week, counting from the date it was "blown in." Considering all the difficulties experienced during 1902, this is a fairly satisfactory record. The largest tonnage for any one month during 1903 was 12,620 tons, or over 400 tons per day. The probabilities are that it will be found economical to reline No. 2 furnace in the course of a few months. The cost of repairs to both No. 1 and No. 2 furnaces will probably be provided for by the credit to relining account.

Efforts have been and are being made to obtain reductions in cost of manufacture. The costs at No. 2 furnace in the items of salaries, labor and incidental expenses have been reduced to the average of the same items for the year 1898, during which year iron was made at a lower cost than ever before or since, thus demonstrating the economy derived from our modern equipped furnace. Raw materials in the shape of fuel, ores and limestone are excessively high compared with present selling prices of iron. Reductions have been secured in the price of coke at ovens, but no help has been extended by the transportation companies in the way of lower freight rates on coke or anything else. Freights paid on incoming material constitute from 35 per cent. to 40 per cent. of the cost of making iron, except in the case of small, isolated furnaces, running on local ore supplies, &c. It, therefore, becomes a very difficult matter to reduce costs of manufacture sufficiently to compete with Southern irons. Lower priced lake ores will not be available until the opening of lake navigation. Measures are being taken to reduce the labor cost of operating No. 1 furnace by the erection of ore bins similar to those in use at No. 2 furnace.

Your directors regret that the outlook for the next six months is far from promising, it being difficult to reduce the costs of manufacture with sufficient rapidity to conform with the greatly reduced market prices of pig iron.

The balance sheet is as follows:

BALANCE SHEET, DECEMBER 31, 1903.

Assets.

Real estate account—Nos. 1 and 2 blast furnaces, including machinery, land (34 acres), equipments, sidings, casting tables, ore trestle, &c., and Yarnall Farm (114 acres)		$1,708,416.42
Pig iron on hand, 356 tons at $13		4,628.00
General stock at furnace (duplicate parts of machinery)		16,743.00
Bills receivable—notes for pig iron not discounted		10,646.42
Cash in bank		67,141.48
Iron making materials on hand—ore, coke, coal, &c.		275,134.82
Accounts collectable—shipments of pig iron		242,166.20
Total		$2,424,876.34

Liabilities.

Capital stock		$1,454,615.00
Bond account		285,000.00
Profit and loss account—Balance January 1, 1903	$103,802.10	
Sundry charges during the year	2,095.69	
	$101,706.41	
Credit by sale of La Rue Mining Company—1-20th interest in lake ore property	3,105.00	104,811.41
Pig iron account—Earnings for the year after deducting usual charges	$180,038.19	
Less interest on bonds and borrowed money	32,843.20	
Net earnings after deducting all charges	$147,194.99	147,194.99
Relining account—Amount reserved for relining furnaces		47,780.96
Bills payable		227,194.11
Accounts payable for book accounts for December		158,279.87
Total		$2,424,876.34

Quick Assets.

Pig iron on hand	$4,628.00
Bills receivable	10,646.42
Cash on hand	67,141.48
Iron making material	275,134.82
Accounts collectable	242,166.20
General stock at furnace	16,743.00
Total	$716,459.92
Less book accounts and bills payable	385,473.98
Balance over all liabilities	$330,985.94

A comparison with the balance sheet of December 31, 1902, shows that bills payable and bond accounts have been reduced to the extent of $171,676.88.

The Fairbanks Company, through their Boston office, have received the contracts for the machinery and valves for the new Berlin Mills at Berlin, N. H.

LABOR NOTES.

Interior wood work on the new Railway Exchange Building, Chicago, has been interrupted by war between the United Brotherhood of Carpenters and the Amalgamated Woodworkers' International Union, the carpenters refusing to set the wood work in the building because work, which they demand as their right, was done in the shops before delivery to the building. This is looked upon by many as the opening gun in what will prove to be a bitter fight between the carpenters and the woodworkers, not only in Chicago but elsewhere.

Nearly 400 employees of the New Haven Iron & Steel Company of New Haven, Conn., are on strike, because of an average reduction of 10 per cent. in wages, announced in December. The situation remains unchanged, the company being firm in their position, and the employees not having made up their minds to return to work.

The Connecticut Railway & Lighting Company have withdrawn their suits against the labor unions and their members, which were the outcome of the Waterbury trolley strike. The injunctions have been withdrawn and attachments taken off the property of the defendants. It had been hoped by employers of labor that these cases would be pressed, in order to procure an additional precedent.

Allis-Chalmers Company, Chicago, have sent out notices to the labor unions represented in their Fraser & Chalmers works, Chicago, to the effect that they wish the present labor contract to expire by limitation on May 1. This notice is in conformance with the terms of the contract itself, and the notice, 90 days ahead, will give both the firm and the union organizations time to arrive at an understanding. P. W. Gates, general superintendent of all the Allis-Chalmers plants, stated that he did not look for any difficulty in coming to a satisfactory settlement between now and May 1. The Allis-Chalmers plants, while nominally run on the open shop basis, are practically union shops, because of the hostile attitude of the union employees toward any non-union man who has the hardihood to accept employment. The firm themselves have steadily declined to enter into any arrangement by which non-union men could not be employed, and have always accorded non-union employees personal protection. No decision has been reached as to the proposition that the firm will make the labor unions.

The Grand Jury of Chicago last week indicted six labor leaders for violence and intimidation in connection with recent strikes at the Kellogg Switchboard Company's plants and other local industries. This makes a total of 30 union labor leaders and subordinates who have been indicted by the Grand Jury, including the following unions: Brass workers, electrical workers, machinists, boiler makers and iron shipbuilders, street car men (Division 260), Franklin Union No. 4, brassmolders and teamsters. An effort is being made by the local authorities to hold the officers of the Federation of Labor for violence committed by members of the unions or at their behest, during the recent strikes, but thus far the labor union authorities have succeeded in suppressing any evidence that would implicate the officials with the acts of their subordinates.

A peculiar incident, illustrating the loss of public favor on the part of trades unions, is a suit filed by the Lentous Packing Company of Los Angeles, Cal., seeking to enjoin labor union organs from placing their name on the "Fair" list, alleging that the publication of their firm name in this line was injuring the business.

"Your petitioner," the document averred, "has lost in business $600 a day since the indorsement of the unions was made public." The petition declared that the designation "fair" is understood to mean that the firm so labeled is subservient to bulldozing labor organizations and that such a reputation was disastrous to business relations with desirable customers.

It is only recently that firms would move heaven and earth to avoid having their names on the "Unfair" list. Apparently, in California at least, the union label is a poor sort of an advertisement for a manufacturing concern, and a boycott has not only lost its terrors, but is preferred to the friendship of organized labor.

The Cement Sidewalk Contractors' Association of Chicago have joined hands with the Industrial Association of America, and will hereafter operate only on the open shop basis.

Chicago is now threatened with a tie up of many of its industries by a factional fight between unions, as the socialistic wing of the old unions has withdrawn and formed a new body, which will antagonize the Federation of Labor and endeavor to cause a split in its ranks.

One hundred and one manufacturers of wagons and carriages in Chicago, members of the Wagon and Carriage Manufacturers' Association, decided to close their shops on January 30, indefinitely, until they could secure certain concessions from the Wagon and Carriage Workers' Unions from demands that were untenable in the present state of the trade. This means that between 2000 and 3000 men are thrown out of employment, about 85 per cent. of whom belong to the Carriage and Wagon Workers' Union. Last November the union made such exorbitant demands for increase of wages, coupled with untenable restrictions, that the manufacturers refused to grant them and a tie up resulted, which was ultimately solved by a board of arbitration, who compromised on giving the men 13 per cent. higher wages than they had the previous year, the arrangement made by the board of arbitration to continue in effect until February 1, 1904. Now that this has expired, the manufacturers are again in a position where they must make an arrangement with their workmen. It is the intention of the manufacturers to remain closed until they can resume work on a strictly open shop basis, with a clause in their agreement with their workmen to the effect that all differences as to wages and hours should be left to a board of arbitration. C. D. Heile, 100 W. Harrison street, is secretary of the Carriage and Wagon Manufacturers' Association.

It is stated that the Illinois Steel Company, owing to a threatened strike by the machinists, have closed down the plate mills of the South Chicago works, throwing 800 men out of employment. The rail mills, which were scheduled to open February 1, are still closed.

The labor disturbances in the limestone districts in the Mahoning and Shenango valleys are gradually being cleared up, and many of the men who at first refused to return to work at the lower wages have since done so. The men at the quarries of the Bessemer Lime Stone Company accepted the lower wage scale and continued at work right along.

Announcement is made that the long fight between Local No. 2 and the New York Housesmiths' Union has at last been settled on an entirely unexpected basis. Both organizations have agreed to disband, and four branch unions will be formed of their members, to be under the control of an Executive Board. The locals will consist of single unions of structural iron workers in Manhattan, Brooklyn, and Jersey City, and a union of finishers besides in Manhattan. All four are to receive separate charters from the International Association of Bridge and Structural Iron Workers. The four branches will represent about 6500 structural iron workers and finishers throughout the metropolitan district.

The Lackawanna Steel Company.—During the past few days the first of the large gas power driven blast furnace blowing engines at the works of the Lackawanna Steel Company, at Buffalo, has been started on blast furnace gas. It has been working very well. The bed plate for the second engine has not arrived, so that the installation cannot begin at once. The third furnace of the company will probably blow in in March, and by May the entire plant, including the rail mill, No. 2, the structural

mill, and the plate mills will be in operation. The bar mill, on which construction was only recently started, is expected to be in operation in July or early in August.

MANUFACTURING.

Iron and Steel.

Application has been made in the Dauphin County courts, at Harrisburg, Pa., by Attorney Lyman D. Gilbert, for the Lochiel Furnace Company, for a decree of dissolution as a corporation. The Lochiel Furnace Company were incorporated November 16, 1871, and for some years operated a blast furnace at Lochiel, Pa., near Harrisburg, which was leased to the Pennsylvania Steel Company in 1895, and later bought by that corporation. The court will hear the application February 18.

At the recent annual meeting of the Roane Iron Company, Rockwood, Tenn., H. S. Chamberlain was elected president; C. M. McGhee, vice-president; O. L. Huribut, secretary, and Frank Nieland, treasurer.

The plant of the United States Tube Company, Buffalo, N. Y., is to be sold by the receiver for the benefit of creditors of the company.

The Diamond State Steel Company, Wilmington, Del., have started up the 10-inch mill, which has been idle for several months.

At a recent meeting of the Fairmont Steel Company, Fairmont, W. Va., J. A. Clark was elected president; Clyde S. Hoyt, vice-president; E. A. Billingslea, secretary, and Walton Miller, treasurer. The company will begin manufacturing operations within the next few days.

In East St. Louis, Ill., the scarcity of orders has compelled a number of large plants to close down. The Leighton-Howard Iron Company and the St. Louis Steam Forge & Iron Works have closed down indefinitely, and the Missouri Malleable Iron Works are only working part of their force. It is estimated that about 2000 men are idle.

The wages of 2000 men employed in the Nicetown works of the Midvale Steel Company, Philadelphia, Pa., have been reduced from 5 to 8 per cent.

At a meeting of the Eastern Steel Company, Pottsville, Pa., these directors were elected for the coming year: August Heckscher New York City; T. I. Crane, Philadelphia; J. A. Burden, Jr., Westbury, Long Island; W. H. Shelmerdine, Philadelphia; C. D. Wetmore, A. S. White, G. W. Young, George H. Cumming, W. F. Donovan, H. P. Whitney, Arthur Turnbull, W. B. O. Field, E. B. Livingston, R. E. Jennings, and G. R. Sheldon, all of New York City.

The largest bridge girders ever manufactured by the Pennsylvania Steel Company at their Steelton, Pa., plant, were turned out last week. They are 116 feet long, 10 feet 8 inches wide and stand 15 feet 8 inches above the top of the rail. Each occupies three flat cars.

No. 2 blast furnace of the E. & G. Brooke Iron Company, Birdsboro, Pa., has been blown out. The company's No. 3 furnace, which is being repaired, will be ready for operation about April 1.

The mills of the Lalance & Grosjean Company, Harrisburg, Pa., resumed operations Monday, February 1, after a shut down of more than a month, on account of the central mills having become overstocked. These mills had not been closed previously for a year. There is every prospect of continued work.

President Charles E. Stafford of the Tidewater Steel Company, Chester, Pa., announces that the mills of that company will resume operations shortly with a fair booking of orders. Slack business caused the mills to be closed. Seven hundred men are out of work.

The pipe mill of the Susquehanna Iron & Steel Company, Columbia, Pa., is being partially operated by the receiver of the company. The mill will start full time upon the receipt of a supply of coal.

Last week there were 20 idle furnaces in the Mahoning and Shenango valleys, five of which are owned by the United States Steel Corporation, two by the Republic Iron & Steel Company, and the remaining 13 by independent operators. Including the furnaces of McKeefrey & Co. and the Cherry Valley Iron Company, at Leetonia, Ohio, there were 13 furnaces in blast, five of which were owned by the Steel Corporation, two by the Republic Iron and Steel Company, and six by independent concerns.

The Youngstown Iron Sheet & Tube Company of Youngstown, Ohio, expect to blow in their blast furnaces at Sharpsville, Pa., at an early date.

The Shenango Furnace Company of Pittsburgh will blow in their No. 1 stack at Sharpsville, Pa., this week. The other two stacks at this plant will likely remain idle for some time.

The Carnegie Steel Company are operating all their hoop mill plants in the Youngstown district, these including the two plants in Youngstown, the Girard, Warren and Greenville plants.

On Saturday, January 30, an attempt was made to sell the plant of the Eleanor Iron & Steel Company, at North Irwin, Pa., at sheriff's sale. However, the Fidelity Title & Trust Company of Pittsburgh served notice that the mill equipment must not be sold, as they held a mortgage on the plant to cover bonds of the company. It was then decided not to offer anything except some scrap and the personal property, which was purchased for $615. The future of this plant is not determined at the present time.

The report that Haselton Furnace of the Republic Iron & Steel Company, at Youngstown, would be started up at an early date, is untrue. This furnace has been idle for some time, and no date has been set for its resumption.

The report that the Haselton plant of the American Bridge Company, at Haselton, Ohio, would be removed to Ambridge, Pa., has been officially denied.

It is reported that the tin plate plants of the American Sheet & Tin Plate Company, at Gas City, Ind., and Cambridge, Ohio, are to be removed to South Sharon, Pa. It is also stated that the sheet mill at South Sharon, which has never been operated, is to be changed into a tin mill.

We are advised that the report that labor troubles exist at the plant of the Stark Rolling Mill Company, sheet manufacturers, of Canton, Ohio, is untrue. This plant has been running as an open mill since August last year, and none of their employees are members of the Amalgamated Association, nor have they been since the mill was declared open.

It is announced that Frank M. Ross, superintendent of the J. M. Guffey Petroleum Company of Pittsburgh, with others, has purchased a site of land at West Haven, Conn., for the purpose of building a steel plant.

The Struthers Furnace Company have their blast furnace at Struthers, Ohio, shut down and are making some improvements. A contract for a small amount of elevating and conveying machinery has been placed with the C. O. Bartlett & Snow Company of Cleveland.

A portion of the plant of the Howard Axle Works of the Carnegie Steel Works, at West Homestead, which has been closed down for several weeks, has started up again. Five hammers have been put in operation and the balance of the plant is expected to start within a short time.

The Paxton Furnace of the Central Iron & Steel Company, Harrisburg, Pa., was blown in on January 30.

General Machinery.

The Estey Mfg. Company, Owosso, Mich., are adding a fourth story to their machine shop.

The Duluth-Superior Traction Company, Duluth, Minn., intend to erect a $15,000 addition to their machine shop.

Charles Herman & Son, Sharpsburg, Pa., manufacturers of pneumatic jarring molding machines, have received a number of orders for these machines for shipment to England.

The El Paso Foundry & Machine Company, founders and machinists, El Paso, Texas, have increased their capital stock to $200,000. The company are enlarging their plant to take care of increased business and are installing traveling cranes. They are also doubling the capacity of their foundry. Many other changes are being made throughout the plant to reduce the cost of production, and new labor saving tools are to be put in.

The Bridgeport Safety Emery Wheel Company, Bridgeport, Conn., have been awarded the contract for eight No. 16 motor driven buffing lathes, a No. 3 motor driven tool grinder and a No. 2 dry grinder. These machines are equipped with Crocker-Wheeler motors. The Bridgeport Company are delivering an order for 40 motor driven buffing lathes for the Stromberg, Carlson Telephone Company, Rochester, N. Y.

The C. O. Bartlett & Snow Company, Cleveland, Ohio, have built and just shipped one of their single cylinder direct heat rotary dryers to the Dakota Pressed Brick Company, Deadwood, S. D., to be used for the drying of sand for the manufacture of pressed brick.

At the regular annual meeting of the stockholders of the National Machinery Company, Tiffin, Ohio, the following officers were elected for the present year: President, Lewis Selle; vice-president, H. N. Reynolds, Dayton; secretary, Early Frost; treasurer, A. Betts; directors: M. Frost, Toledo; O. C. Ewart, New York; Eugene Barney, Dayton; Mrs. A. Rohn, Tiffin.

The Binghamton Railway Company, Binghamton, N. Y., are to build an extension to Owego, 12 miles, and will also erect and equip a car house and repair shop.

The Vulcan Mfg. Company, who recently bought and equipped the plant of the Kellogg & Wakefield Mfg. Company, Winsted, Conn., have started up the tool making department. The machinery department will be started up shortly, and subsequently operations will be commenced in the plating, buffing and foundry departments.

The American Locomotive Company have received contracts for five engines from the New York, Chicago & St. Louis Railroad and two from the Toledo, St. Louis & Western Railroad.

The National Foundry, Mfg. & Supply Company, Williamsport, Pa., have leased the foundry, machine and pattern shops formerly occupied by the Lebanon Machine Company, who were absorbed by the American Wood Working Machinery Company.

The shops comprise about 30,000 square feet of floor space and are equipped with engine, boiler, foundry cupola, line shafting, &c., in addition to which the company have purchased such machine tools, molding machinery, &c., as they require. The company are now ready for business, and already have some nice orders on hand. They manufacture power transmission machinery and castings.

The Orient Coal & Coke Company, Youngstown, Ohio, have placed a contract with J. & J. B. Milholland, Pittsburgh, for a large coke crusher, to be installed at their works at Uniontown, Pa.

Power Plant Equipment.

The Phœnix Iron Works Company, who are represented in Pittsburgh by J. D. Lyon & Co., Farmers' Bank Building, have installed for the Jones & Laughlin Steel Company five cross compound Phœnix engines. J. D. Lyon & Co. have also sold to the Leetsdale Ice Company, Leetsdale, Pa., one 100 horse-power Mertes engine and one 50 horse-power Olds engine.

The city of Humboldt, Tenn., will purchase two 1,000,000-gallon pumps and a 14 x 36 inch Corliss engine for the water works. E. E. Davis, city engineer, Dyersburg, Tenn., has the work in charge.

The Central Construction Company, Oshkosh, Wis., have been awarded the contract, at $12,417.43, for the municipal electric light plant at Negaunee, Mich. A Stanley generator of 200 kw. capacity will be used. Jno. Davey, chief engineer and electrician of the Winnebago Traction Company, Oshkosh, Wis., was consulting engineer.

The Warren, Cortland & Jefferson Electric Railroad Company, Cortland, Ohio, will erect a $200,000 power house at that place. C. G. Phillips is general superintendent. Francis B. Morgan, New England Building, Cleveland, has charge of all construction.

The Central California Machine Works, B. F. Cathcart, proprietor, Fresno, Cal., will erect a new and larger shop for the building of gas engines. They are now building engines from 6 to 35 horse-power, to which will be added a line of centrifugal pumps.

A. M. Nipper, superintendent, Hannibal, Mo., is ready to receive bids for rebuilding and enlarging the municipal electric light and power plant, for which the city has voted $100,000 of bonds.

On February 16 the citizens of New Freedom, Pa., will vote on the question of putting in a water and lighting plant. We are informed that the matter will probably be decided favorably, and no specifications will be sent out until after the election. The present plan is to install a 100 horse-power plant. The specifications call for two 50 horse-power boilers, two 50 horse-power Corliss engines, motors and pumps to be electrically operated. About 8000 feet of from 3 to 8 inch cast iron pipe is also required. No engineer has as yet been selected. A. Reehling, chief burgess, has the matter in charge.

A. W. Mahon, engineer, Glasgow, Mont., desires to hear from supply houses and contractors for the equipment and construction of water works and a sewer system for that place. Preliminary surveys for the plant are now being made.

The Albion Engine & Motor Company, Albion, Mich., recently purchased by L. H. Field and associates, will be combined with the Trask-Field Engine Company, Jackson, Mich., and the two plants consolidated at the latter place, where they have leased half of the large plant, 60 x 200 feet, of the Jackson Automobile Company. The business will be conducted by the newly organized Jackson Engine & Motor Company, and the equipment will comprise about $16,000 worth of machinery, taken from the two plants. It is not probable that any new machinery will be purchased at the present time. The company will make the Miller gasoline engine.

H. S. Whitney, representing the Ashcroft Mfg. Company, Consolidated Safety Valve Company, Hayden & Derby Mfg. Company and Hancock Inspirator Company, has put in a stock of steam gauges, valves and other steam specialties made by his firms, at 22 to 26 South Canal street, Chicago.

The Shamokin Extension Electric Railway Company, Shamokin, Pa., will place contracts in the next few months for building and equipping 24 miles of road. A power house and car house will also be built and equipped.

Plans are on foot for the establishment of a gasoline engine plant in Stonington, Conn. The moving spirits in the enterprise are Charles E. Latham and William F. Broughton, the former of whom has a shop on Main street, where he is at present making engines of the oscillating type, of 2 horse-power, and which can be gauged together 2, 4 or 6 on one shaft, all doing their proportion of the work. He also has a patent on a carbureter. Should they be successful in establishing a larger plant it is their intention to build larger engines, designed especially for marine purposes.

The Bureau of Yards and Docks, Navy Department, Washington, are having printed a specification covering an extension of the water system at the Puget Sound Navy Yard, Bremerton, Wash., which will comprise a triplex single acting power pump driven by an electric motor; a 10-inch suction pipe, about 3400 feet of 8-inch diameter cast iron water main, together with fittings and valves, furnished and installed complete in every particular. The funds available for the work amount to $9000.

The McKelvey Electric Company of Youngstown, Ohio, have been incorporated with a capital of $10,000, and will manufacture electrical appliances.

Foundries.

The Alamo Mfg. Company, Hillsdale, Mich., will rebuild their foundry, which was recently destroyed by fire. The company recently increased their capital stock to $500,000 for the purpose of making improvements to their plant.

The Damascus Bronze Company, South avenue, Allegheny, Pa., have bought from the Martin Hartzog Mfg. Company 50 x 180 feet of property adjoining their plant, and will use the ground to enlarge their foundry. When these improvements and additions have been made the plant of the Damascus Bronze Company will have a frontage of 125 feet and will be 180 feet deep.

William J. Burleigh, Charles G. Johnson and Dr. C. N. Hazelton have purchased the business of the estate of C. H. Presbrey, Sterling, Ill., and will continue to run it along the same lines as heretofore and under the name of the Novelty Iron Works. The principal articles of the company's manufacture are porcelain lined pump cylinders, wood pump trimmings, and the Handy automatic stock fountain.

The W. A. J. Jones Foundry & Machine Company, Chicago, have entered into an arrangement for the manufacture of a patented door, the invention of John Erwood, Chicago.

Octave Jacqmain has been appointed receiver for the Matthews Steel Casting Company, Matthews, Ind.

John F. Nash has been appointed receiver for Levi Plant, who conducts a foundry in Syracuse, N. Y. The liabilities are stated to be between $20,000 and $25,000, and the available assets $10,000.

The United States Malleable Iron Company, East Toledo, Ohio, have let contract to Frank Stahl for the erection of several additions to their plant, which consist of a main, or foundry, building, 70 x 400 feet; pattern shop, 40 x 70 feet; storage room, 30 x 50 feet, and storage sheds. Specifications are not yet ready for machinery.

J. W. Morrison, Jr., Youngstown, Ohio, has associated himself with Charles A. Stroh, formerly of the George B. Sennett Company, Youngstown, and they have formed a partnership to be known as the Morrison Brass & Iron Foundry Company. They will remodel the old Morrison foundry and machine shop in Youngstown and will add considerable new equipment. They will make both brass and iron castings, with mill brasses and bronzes a specialty.

The Homestead Valve Mfg. Company, Incorporated, Pittsburgh, with works at Homestead, Pa., advise us that they have succeeded in making brass and iron castings of the very highest quality in their foundry by the use of a patented furnace, which enables them to furnish a quality of valves that has heretofore been unknown.

Bridges and Buildings.

The Groton Bridge Company, Groton, N. Y., have increased their capital stock from $50,000 to $100,000. The increased capital will be used for carrying on the business. The company do not contemplate erecting any additional buildings or purchasing any new machinery at present.

A bridge to cost $100,000 is proposed for the Whitewater River at South H street, Richmond, Ind. The length of the structure will be 900 feet, and the base of the rail 109 feet above low water. H. L. Weber is city civil engineer.

E. L. Danner, Kokomo, Ind., is in the market for Bedford stone, structural iron and steel, fire proof roofing, cement, &c., for the new power plant of the Kokomo, Marion & Western Traction Company, contract for the building of which he has secured. The plant is to cost about $35,000.

Bids will be received at the office of the city clerk, Sioux City, Iowa, until February 16 for the construction of a three-truss 162-foot steel bridge, with 40 feet of approaches, over the Floyd River.

The Missouri Valley Bridge & Iron Works, Leavenworth, Kan., have secured the contract for a bridge over the Kansas River at Eudora, Kan. The amount of their bid was $28,434.

George F. Rhodes has asked the Court in Chancery in Trenton, N. J., for the appointment of a receiver for the business of Charles F. Moore and the New Jersey Dock & Bridge Building Company, Elizabeth.

The Kellogg Iron Works, Buffalo, N. Y., have been awarded the contract for the steel fire proof building for the new pumping station at Ithaca, N. Y.

At the annual meeting of the stockholders of the Decatur Bridge Company, Decatur, Ill., held January 23, the following officers were elected for the ensuing year: President, T. L. Blackburn; vice-president, G. A. Caldwell; secretary, E. B. Tyler; treasurer, W. M. Wood. At this meeting it was decided to increase the capital stock from $30,000 to $50,000, the additional $20,000 all being taken by the present stockholders.

The Pueblo Bridge Company, Pueblo, Col., have secured contract for a steel bridge across the Grand River, between

Rifle and Parachute, near Morris siding, Col. The amount of the bid was $10,915.

The La Crosse Steel & Bridge Company, La Crosse, Wis., have secured contract for erecting a steel bridge over the west channel of the Mississippi River, at La Crosse, the contract price being $14,782. The contract calls for the completion of the bridge by March 15, 1904.

The Caldwell & Drake Iron Works, structural and ornamental iron and steel, Columbus, Ind., who have been operating for the past year, have incorporated for $100,000. The officers of the company are as follows: Geo. W. Caldwell, president; John F. Hutchings, vice-president and general manager; Lester Drake, treasurer; James E. Ferry, secretary; Don G. Scott, chief engineer. .

Fires.

The large silk mills of Ashley & Bailey, Paterson, N. J., were almost totally destroyed by fire January 30. The loss is estimated at $300,000.

The Reid Boiler Works, Bellingham, Wash., were recently damaged $6000 by fire.

The old plant of the Riverside Bridge Company, Martin's Ferry, Ohio, was recently destroyed by fire. The loss is placed at $25,000.

The Wabash grain elevator, at Seventy-sixth street, near Western avenue, Chicago, owned by R. E. Pratt & Co., was destroyed by fire January 28, entailing a loss of $75,000.

Hardware.

The Spencer Wire Company, Worcester, Mass., have bought the business of the Globe Staple Company, Providence, R. I., and are removing the machinery to the works at Worcester, where the business will be conducted as a separate department. The Globe Staple Company manufactured staples, screw eyes and screw hooks. The new department will employ about 25 hands as a beginning.

The Vulcan Mfg. Company have acquired the factory of the Kellogg & Wakefield Mfg. Company, Winsted, Conn., where it is planned to manufacture a line of self heating implements, including flatirons and soldering and brazing tools and the Hercules air compressing pump. The company are incorporated under Delaware laws, with an authorized capital stock of $600,000. The officers are: President, William Spitler of New Haven; vice-president, William R. Dodge of Hartford; secretary, Charles B. Greene of Hartford; treasurer, William H. Dodge of Hartford, and general manager, George F. Dinsmore.

W. L. Barrett, manufacturer of Barrett's glass cutters, has moved from his former quarters on Parallel street, Bristol, Conn., to his new factory on School street. He now has a one-story brick building, 34 x 96 feet, with an L of 15 feet, the new plant being well equipped to meet the demands of his business, which is steadily increasing in volume.

Moline Plow Company, Moline, Ill., are intending to build in St. Louis, Mo., a warehouse similar to those which they have in various parts of the country. They have operated in St. Louis for many years, but in rented property. The new warehouse, however, will be owned by them, as they have lately purchased a corner lot in the railroad district in the North End, fronting 80 feet on Second street with a depth of 150 feet on Madison street.

Miscellaneous.

The winding of a new 6-inch Brown gun has been begun at the Scott Works, Reading, Pa., and the weapon will be ready for trial by May. It will be 26 feet long and will weigh about 20,000 pounds. The steel wire is wound around the barrel under a pressure of 2500 pounds. It will require 21 layers to cover the breech and seven from the end of the breech to the muzzle. The gun will withstand a pressure of 225,000 pounds to the square inch. If the new gun proves satisfactory its inventor will start a factory of his own.

At the annual meeting of the stockholders of the Harbison-Walker Refractories Company, held in the Farmers' Bank Building, Pittsburgh, on Monday, January 18, the following directors were elected: S. P. Harbison, S. C. Walker, W. W. Croft, J. B. Cullom, O. M. Reif, L. C. Turley, E. M. Allen, George W. Reese, H. F. Bigler, Alexander Patterson, T. H. Given, A. P. Green, W. A. Stanton, T. L. Chadbourne, Jr., Hay Walker, Jr. S. C. Walker was re-elected president and H. W. Croft, first vice-president. J. B. Cullom was made second vice-president, vice F. H. Wigton, and W. A. Stanton, third vice-president, vice Mr. Cullom. G. W. Reese was selected fourth vice-president, and Hamilton Stewart, secretary and treasurer.

The Energine Company, Cleveland, Ohio, have been incorporated with $10,000 capital stock, by F. B. Many, R. P. Beardslee, George G. Whitcomb, George H. Kelly and F. B. Williams. They propose to establish an oil refinery in Cleveland for the manufacture of a peculiar oil refined by a secret process, designed especially for use in gas engines, automobiles and launches. It is claimed the fuel is entirely odorless and that it has 75 per cent. greater efficiency than gasoline.

The Security Steel & Iron Company have been incorporated at Troy, N. Y., with a capital stock of $100,000. According to reliable reports, the company have secured the old Gilbert car works, on Green Island, where they will manufacture steel and iron railroad supplies. The officers are: Senator E. T. Brackett of Saratoga, president; J. J. Ryan of Troy, vice-president; T. H. Champion of Troy, secretary; Joseph J. Murphy of Troy, treasurer; F. L. Quinn of Saratoga, general manager, who, with Judge James L. Scott of Saratoga, John W. McNamara of Albany and Edward Murphy of Troy, constitute the Board of Directors.

The H. M. Reynolds Roofing Company, Grand Rapids, Mich., report that the contracts which they have booked for future delivery have justified them in increasing the capacity of their plant fully a third. To do this they are building a series of wells which will enable them to handle raw materials in tank cars and thus make a very large saving in both freights and handling. Last year the capacity of their plant was increased nearly one-half, and it was an exceptionally good year. The company report that the outlook, as far as booking orders for future delivery is concerned, has never been as promising as at the present time.

The Wells Mfg. & Supply Company have been incorporated at Indianapolis, Ind., with $25,000 capital stock, by Ambrose H. Wells, Benton Forkner, Edward J. Storms and E. E. Gebhardt. Ambrose H. Wells is president of the company. Their line is fire proof safes, electric railroad supplies, factory, mill and office supplies. The company have a factory at Columbus and at Cincinnati. The company may build in Indianapolis.

Appraisers have set a valuation of $20,000 on the plant of the Hoke Mfg. Company, Frankfort, Ind., which recently went into a receiver's hands. It was said at that time by the officers of the company that the value of the plant was $60,000. The liabilities are about the appraised value of the plant.

The Piedmont Construction Company have been incorporated at Indianapolis, Ind., with $75,000, to do a general electric business, contract for the building of interurban roads, &c. The incorporators are Joseph Littell, Jas. P. Wilson and Geo. E. Coughlin.

The Columbus Buggy Company, Columbus, Ohio, have surrendered their charter, obtained from New Jersey, and have reincorporated under the laws of Ohio with a capital stock of $1,000,000, of which $700,000 is common stock and $300,000 cumulative preferred. They have not yet moved all of their old plant to the new site, the new buildings not being completed. The company expect to exchange some of the old machinery and put in new equipment. The machinery needed will be wood working, both for bodies and wheels; also power hammers, electric machinery, &c., for the forge department.

The Syracuse Safe Company, Syracuse, N. Y., recently organized, have leased the Phœnix foundry buildings, which they are repairing and improving, for the manufacture of fire and burglar proof safes and vaults. The equipment was purchased through the Syracuse Supply Company, Syracuse, and the Garvin Machine Company, New York. Electric power will be used, which will be supplied by the Syracuse Power & Lighting Company. At present the company are placing orders for stock and expect to be able to start operations about February 15. Louis Aaron is president; W. H. Holmes, secretary, and J. Towers Kidd, treasurer.

The Penfield Coupler & Mfg. Company, St. Joseph, Mo., have incorporated with a capital stock of $500,000, for the manufacture of a patent car coupler. The company have not yet decided whether they will build a plant; in fact, no plans for the future have been decided upon. All communications should be addressed to A. H. Penfield, Room B, German-American Bank Building, St. Joseph. The other incorporators are William H. Johnson, Kansas City, and Sterling P. Iles, Meers, Okla.

The Iowa State University, Iowa City, Iowa, are having plans prepared for a new science building. The building will cost about $275,000, and will be of steel and stone construction. Proudfoot & Bird, Des Moines, Iowa, are the architects. Bids will be received about June 1.

Major Thomas Cruse, Quarter Master, St. Louis, Mo., will receive sealed proposals until February 18 for furnishing and erecting a 150,000-gallon steel tank and trestle at Jefferson Barracks.

Chas. W. Stiver, 220 Shearer Building, Bay City, Mich., and associates have purchased 987 acres of coal land near Bay City, on which a coal mine is located. Under the coal seam is a fine grade of clay, suitable for manufacture of paving brick, building brick, &c., and it is proposed to erect a plant for brick manufacturing purposes.

The West Virginia Steel Company, Wheeling, W. Va., manufacturers of metal ceilings and corrugated iron, having defaulted on the interest on their bonds, the Wheeling Dollars & Savings Company, trustees for the bond holders, have given notice that the entire plant will be offered at public sale on Saturday, March 12. The amount of bonds upon which default has been made is $37,000

The Reading Spinning Company, Reading, Pa., will this spring erect a four-story factory, with power plant and elevator, and will equip same with special machinery.

Through an error the incorporation of the A. B. Warman Laundry Company, Scranton, Pa., was noted in these columns December 17 as the A. B. Warman Foundry Company.

The Brockport Wagon Company, Brockport, N. Y., have been incorporated with a capital of $25,000, for the manufacture of carriages, wagons and their attachments, and will erect and equip a four-story factory for that purpose on Main street. The officers are: Samuel Howell, president; A. E. Furney, manager, and A. G. Coleman, secretary.

The Continental Metal Company, 9-15 Seabring street, Brooklyn, N. Y., have incorporated for the manufacture of bearing metals for journal boxes in railway, steamship, electrical equipment and all classes of mechanical service. The company have a fully equipped plant and are prepared to quote prices and make prompt deliveries. Their leading brands are Arm & Hammer, Dynamotor Metal, Uncle Sam and Anvil Metal. The manufacturing department is under the supervision of Charles B. Lawrence, who was for years general superintendent of the Magnolia Metal Company, and B. F. Burger, who was special sales agent for the Magnolia Company, is general manager.

The Pressed Steel Car Company of Pittsburgh have received an order for 200 freight cars from the Long Island Railroad.

A Decision in the Continuous Open Hearth Patent Case.

There has just been rendered a decision by the Court of Appeals of the District of Columbia in the case of Benjamin Talbot, appellant, and Ambrose Monell, appellee, which involves the patent in the continuous open hearth process. The litigation has been a protracted one. The one party in interest is Benjamin Talbot, formerly of Pencoyd, Pa., and now of Leeds, England. With him are Percival Roberts, Jr., of Philadelphia, and the Lackawanna Steel Company, who purchased a controlling interest in the company organized to develop the Talbot inventions, subject to the prior shop right granted to Jones & Laughlin Steel Company of Pittsburgh. Ambrose Monell was at the time of the invention one of the engineers at the Homestead plant of the Carnegie Steel Company, and is now president of the Orford Copper Company. The opinion is as follows:

This is an appeal from the decision of the Commissioner of Patents, in an interference case, wherein the appellant, Benjamin Talbot, and the appellee, Ambrose Monell, contend over the question which of them is the prior inventor of a process for the manufacture of steel, which is described in three several counts, as follows:

"1. The method herein described of making steel, which consists in introducing into a basic open hearth furnace iron oxide and lime and molten pig iron, substantially eliminating phosphorus from the iron while the iron is at a comparatively low temperature; withdrawing at an early stage, in the removal of carbon, the bulk of the slag containing the eliminated phosphorus, and heating the bath of metal and oxidizing the carbon until the carbon has been reduced to a point at which the metal is to be tapped.

"2. The method herein described of making steel, which consists in introducing into a basic open hearth furnace iron oxide and lime and molten pig iron, substantially eliminating phosphorus from the iron while the iron is at a comparatively low temperature; withdrawing at an early stage, in the removal of carbon, the bulk of the slag containing the eliminated phosphorous, without withdrawing the metal, then heating the bath of metal and oxidizing the carbon until the carbon has been reduced to a point at which the metal is to be tapped.

"3. The method herein described of making steel, which consists in introducing into a basic open hearth furnace iron oxide and lime, heating the same, then introducing molten pig iron, substantially eliminating phosphorus from the iron while the iron is at a comparatively low temperature; and withdrawing at an early stage, in the removal of the carbon, the bulk of the slag containing the eliminated phosphorus, heating the bath of metal and oxidizing the carbon until the carbon has been reduced to the point at which the metal is to be tapped."

The counts are substantially the same; the process in controversy is one which is known as the "basic pig and ore process," as distinguished from the Bessemer process for the manufacture of steel.

Monell, the appellee, has a patent for the invention, issued to him on June 9, 1900, upon an application filed on March 10, 1900. His preliminary statement alleges conception of the invention by him on January 6, 1900; disclosure of it to others on the same day, and reduction to practice on February 1, 1900.

Talbot, the appellant, is the junior applicant. He did not file his application until December 6, 1900, which was six months after the issue of the patent to Monell; and he then merely took the claims and the specifications of Monell's patent and introduced them into his own application. His preliminary statement alleged conception of the issue by him about the year 1888, disclosure to others about the middle of the year 1891, and reduction to practice in January of 1893.

After voluminous testimony taken on both sides, the three several tribunals of the Patent Office concurred in awarding judgment of priority of invention to the appellee, Monell; and from the judgment of the commissioner, Talbot appealed.

The appellant has the double burden in the court of proving his case beyond a reasonable doubt; 1, because he has a patent to overcome; and, 2, because of the concurrent decisions of the Patent Office against him. He assumes to bear the burden successfully by seeking to show that the tribunals of the Patent Office, in the first place, construed the issues too broadly, and, in the second place, construed them too narrowly—an argument which certainly savors to some extent of inconsistency. We do not find that they have done anything of the kind. There does not seem to be any ambiguity about the issues. If there were, it would be proper to construe them in the light of the specifications from which they were taken.

The appellant adopted them as his own by taking them bodily from the appellee's specifications, and it was for the appellee to determine their proper construction, and not for the appellant. But we find no such difference or difficulty of construction as the appellant assumes. The tribunals of the Patent Office simply held that certain operations of the appellant did not fall within the terms of the issue; and in that conclusion we think that they were entirely right. That the appellant himself, at one time, thought they were right is clear, from a paper in the *Journal of the Iron and Steel Institute* for 1900, from the pen of the appellant, in which he contrasts his own operations with those of the appellee and ridicules the latter as inoperative.

We do not deem it necessary to add another opinion to the three full and satisfactory opinions of the tribunals of the Patent Office. We are satisfied to adopt as our own what the commissioner says in his clear and cogent conclusion in the case. He says:

"The evidence, taken as a whole, fails to show that Talbot was in possession of the invention prior to the time when Monell made it. Aside from the testimony as to the character of the process performed by Talbot, his conduct in reference to this invention is very significant and entitled to much weight. He claims to have been in possession of the same more than ten years ago, but he has made no effort to obtain a patent upon it, although he did patent some of the processes he performed, and which he now claims came within the present issue. When Monell read a paper before the Iron and Steel Institute, describing the process, Talbot ridiculed it as a whole, although he said that it included some steps which he had invented. Even after hearing that paper, Talbot did not come in with his patent; but six months later, after he had visited Homestead and seen Monell's process in operation, he made great haste to prepare his application. In preparing this application he did not describe what he had done, but copied Monell's process from Monell's patent."

We have repeatedly held that action such as herein stated on the part of Talbot—and the statement is fully justified by the record—is sufficient ground to discredit the claim of priority of invention.

We are satisfied that the commissioner's conclusion is right and just, and that it should be reaffirmed; and that the credit of priority of invention should be awarded to the appellee.

The clerk of the court will certify this opinion and the proceedings of the court in the premises, to the Commissioner of Patents, according to law.

The National Metal Trades Association

CINCINNATI, Ohio, February 1, 1904.—The rumor extant of possible trouble between employers and machinists, on account of reduction of wages, is, according to Commissioner Du Brul of the National Metal Trades Association, without foundation at this time. Mr. Du Brul leaves this week for Washington, D. C., to lend all the aid in his power in defeating the power boat bill. There was formed at Trenton, N. J., last Thursday evening, a local manufacturers' and employers' association, with Clifton Reeves of the Reeves Engine Company as temporary secretary. This association is now arranging with a prominent newspaper man to take the position of permanent secretary. Thanks to the membership in Cleveland, the Harris Automatic Press Company labor difficulty will be so arranged that they will be enabled to have their $15,000 press built and shipped within the specified time.

The Administrative Council have fixed on Philadelphia as the place to hold the next convention of the National Metal Trades' Association, and set the time for March 21 and 22. Arrangements have been made with several prominent speakers to address the convention on matters pertaining to shop methods and management. The following subjects will come up for discussion:

In the light of present developments, how should organized labor be dealt with?

Do the teachings and methods of organized labor tend to create good citizenship?

What must be the effect on the United States, if organized labor is permitted to run its course?

What can the National Metal Trades Association do toward the establishment of a national apprenticeship system?

What further can our association do toward educating the public on present industrial questions?

What more vital question is before the American public today than "The Open Shop?"

Is a universal standard of hours desirable, and if so, is it attainable in the machinery business?

Is there any reason to believe that national agreements with national unions are desirable?

What should be the proper function of employers' associations, and how can the interest in such associations be maintained during times of labor inactivity?

Should not the members of the National Metal Trades Association do everything possible to establish piece work and premium work on a fair and equitable basis?

Should the metric system be introduced into American shop practice?

Have high speed tool steels increased production as much as could reasonably be expected?

Can employment bureaus be undertaken to advantage in small cities?

The association is making determined efforts to defeat the passage of the anti-injunction bill, which is a bill to limit the meaning of the word conspiracy and the use of restraining orders in certain cases. Quite a number of reasons seem plausible as to why this bill should not pass, among which we mention the following: Dangerous to employers and employees alike; revolutionary in its purpose; pernicious, as being class legislation and nullifying the power of the courts; it would be a weapon in the hands of the American Federation of Labor, because it would force men to join their ranks.

All arrangements have been perfected for the meeting at Philadelphia, and it is hoped to make it one of the best both as to attendance and interest manifested.

A Large Contract for Cahall Boilers.—The Aultman & Taylor Machinery Company of Mansfield, Ohio, have secured through the Cahall Sales Department, W. W. Darley, general Western agent, Farmers' Bank Building, Pittsburgh, the largest installation of boilers for the Louisiana Purchase Exposition at St. Louis. The installation will consist of eight 500 horse-power and eight 400 horse-power Cahall horizontal water tube boilers, all equipped with the Mansfield chain grate stokers. The aggregate of these 16 boilers is 7264 horse-power. Four of the 500 horse-power boilers are built to carry 225 pounds working pressure, and the other 12 boilers are built to carry a working pressure of 175 pounds. The Aultman & Taylor Machinery Company install foundations, furnish the boilers and do all the brickwork, and the total value of the installation is in excess of $165,000. The weight of the entire equipment is approximately 3500 tons, and it will take 125 freight cars to transport it. If the tubes in these boilers were placed end to end they would reach over a distance of twelve miles. The entire 16 boilers will be equipped with induced draught, furnished by the Buffalo Forge Company. These 16 boilers constitute about two-thirds of the entire exhibit in the steam, gas and fuel building, and all the boilers will be installed and in operation by April 15.

OBITUARY.

RICHARD G. HOPE, auditor for the Colonial Steel Company of Pittsburgh, died last week at his residence, Allegheny, Pa., after a short illness. Two weeks ago he suffered a stroke of paralysis, from which he never recovered. Mr. Hope was born in Pittsburgh, February 27, 1844. When a young man he secured employment in the office of the Allegheny Valley Railroad Company, remaining but a short time. He then entered the employ of Hussey, Howe & Co., and later that of Howe, Brown & Co., with whom he remained for 35 years. When that company was absorbed a few years ago by the Crucible Steel Company he left their employ and since the organization of the Colonial Steel Company had been their auditor.

DAVIS C. LAPP, who, for nearly half a century, conducted a large brass foundry at 718 Cherry street, Philadelphia, died January 22 at his home in that city, aged 83 years. He was a native of Chester County, Pa.

GEORGE B. SPENCER, president of I. F. Spencer's Sons, manufacturers of iron and brass castings and general hardware, died January 19 at his home in Guilford, Conn., from heart disease, aged 63 years.

The National Tube Company of Ohio.—Application is to be made in Ohio for a charter for a company to be known as the National Tube Company of Ohio. This company will be owned by the United States Steel Corporation, and under its charter the Ohio plant of the National Tube Company, now building at Lorain, and the Ohio plant of the Lorain Steel Company at the same place, will be operated. The National Tube Company of New Jersey, with headquarters in Pittsburgh, while entirely separate and distinct from the Ohio corporation, will hold the stock of the Ohio corporation in such a way that the two concerns of the same name will be operated in perfect harmony and practically as one company.

The United States Steel Products Export Company, the export end of the United States Steel Corporation, have been awarded the contract for the steel to be used in the construction of the electric traction, light and power plant to be built in Manila, Philippine Islands, by the Manila Electric Railroad & Lighting Corporation. The Westinghouse and other Pennsylvania interests are largely concerned in this enterprise. Frank H. Buhl, formerly president of the Sharon Steel Company, is vice-president, and Peter L. Kimberly of Sharon, is a director. George C. Smith, president of the Securities Company, Pittsburgh, and Henry C. Conant of Westinghouse, Church, Kerr & Co., the engineering end of the Westinghouse manufacturing interests, are also on the board.

At the annual meeting of the British Westinghouse Electric & Mfg. Company, Limited, to be held in London, England, on February 5, a resolution will be submitted that the capital of the company be increased to £3,250,000 by the creation of 100,000 6 per cent. preference shares of £5 each; such preference shares are to rank in all respects with existing preference shares.

The regular monthly meeting of the Independent Sheet Manufacturers' Association was held in Pittsburgh last week. James A. Campbell, president, was in the chair, and nothing but routine business was transacted.

George W. Hughes has been appointed furnace superintendent of the Everett furnace at Everett, Pa. Mr. Hughes has been connected with the furnace plant for a number of years.

The Iron and Metal Trades.

A good deal of interest attaches to the meeting at Cleveland to-morrow of the miners and shippers of Lake Ores, at which prices for the coming season of 1904-1905 are to be discussed. It is well known that the accumulations of Ore on the docks at Lake Erie ports are very large, and that the amount to be mined this year will be very small. In fact, it is understood that the leading interest will operate only those mines on whose product royalties must be paid, keeping the fee mines idle. Sales for the next season have been exceedingly light thus far, and the condition of the Pig Iron market is such that merchant furnaces will need tempting figures before they take hold.

The time is again coming around when sellers of Southern Foundry Iron are more eagerly looking for business for forward delivery. The heavy bookings of the last quarter of the last year took care of a considerable part of the stock, of current output, and of production for the first two months. It is now a question to provide for the second quarter, and the feeling is weaker, with some sellers now quoting on the basis of $9.50 for No. 2 at Birmingham. Some fair quantities are under negotiation both as to Basic and as to Foundry grades.

Furnaces on the lake shore and in the Central West are making low figures, and reports of $12 for No. 2, at furnace, are current.

The United States Steel Corporation are blowing in additional stacks, and have very largely increased production to cover requirements. The drastic measures of November and December have told, and it is understood that even with the new capacity at work the requirements are urgent.

Specifications for Steel are coming in at a more lively rate, and tonnage is increasing.

The sale of 40,000 tons of Steel Rails by an Eastern mill to the Canadian Pacific Railroad has been causing a good deal of comment and discussion. It is understood that the price was $21.25, Montreal, which is lower than was arranged for. It is figured that it nets the mill about $18, but it must be remembered that the works in question have the advantage of a drawback of the duty on the foreign Ore, which is used almost exclusively. This would figure upward of $1 per ton of Rails, taking account of waste in conversion.

The paucity of orders from the railroads has brought to grief a very long established pool—that on Locomotive Tires. Lately Open Hearth Steel Tires have sold as low as 2.50c., delivered at distant Western points.

The arrangement existing among the three leading mills of the Central West which make Hoops and Bands has gone to pieces, and low prices are being made. Since this happened on the eve of fixing prices for Cotton Ties, an open market for the latter seems certain.

Reports from the Wire and Tube trades continue excellent. The condition of the latter is reflected by sales aggregating over 10,000 tons of Skelp. Reports relating to the Bar trade are mixed. Some note a very good tonnage and others complain of local cutting.

A somewhat better volume of business is coming out in Plates and in Structural Material, but even with this encouragement the tonnage is quite inadequate.

The independent Sheet manufacturers, at a meeting held last week, appointed a committee to confer with the leading interest on prices. Pending this conference, lower quotations have been withdrawn, but all announcements of an advance are decidedly premature.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Feb. 3, 1904.	Jan. 27, 1904.	Jan. 6, 1904.	Feb. 4, 1903.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$14.50*	$14.50	$14.75	$22.25
Foundry Pig No. 2, Southern, Cincinnati	**12.25**	12.50	12.00	21.25
Foundry Pig No. 2, Local, Chicago	*14.00*	14.00	14.50	23.00
Bessemer Pig, Pittsburgh	*13.85*	13.85	14.10	21.60
Gray Forge, Pittsburgh	*12.75*	12.75	13.00	20.50
Lake Superior Charcoal, Chicago	16.75	16.75	16.75	26.50
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	23.00	23.00	23.00	29.50
Steel Billets, Philadelphia	*24.00*	24.50	24.25	27.50
Steel Billets, Chicago	24.00	24.00	24.00	30.00
Wire Rods, Pittsburgh	30.00	30.00	30.00	35.50
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	**11.00**	10.50	9.00	18.00
O. Steel Rails, Philadelphia	**12.75**	12.50	11.50	20.75
O. Iron Rails, Chicago	**16.00**	15.00	13.00	24.00
O. Iron Rails, Philadelphia	*15.50*	15.50	16.00	23.50
O. Car Wheels, Chicago	**13.50**	13.50	13.00	24.00
O. Car Wheels, Philadelphia	**13.00**	13.00	12.75	20.50
Heavy Steel Scrap, Pittsburgh	**13.00**	13.00	11.00	21.00
Heavy Steel Scrap, Chicago	**10.50**	10.50	10.00	18.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.35	1.35	1.35	1.93½
Common Iron Bars, Chicago	**1.40**	1.40	1.30	1.77½
Common Iron Bars, Pittsburgh	*1.29¾*	1.29¾	1.34¾	1.80
Steel Bars, Tidewater	1.44½	1.44½	1.44½	1.75
Steel Bars, Pittsburgh	1.30	1.30	1.30	1.60
Tank Plates, Tidewater	1.74½	1.74½	1.74½	2.10
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.74½	1.74½	1.74½	1.75
Beams, Pittsburgh	1.60	1.60	1.60	1.60
Angles, Tidewater	1.74½	1.74½	1.74½	1.75
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Skelp, Grooved Iron, Pittsburgh	*1.45*	1.40	1.50	1.90
Skelp, Sheared Iron, Pittsburgh	**1.52½**	1.45	1.50	1.95
Sheets, No. 27, Pittsburgh	*2.15*	2.15	2.25	2.65
Barb Wire, f.o.b. Pittsburgh	**2.50**	2.50	2.45	2.50
Wire Nails, f.o.b. Pittsburgh	**1.90**	1.90	1.85	1.90
Cut Nails, f.o.b. Pittsburgh	*1.70*	1.70	1.90	2.10
METALS:				
Copper, New York	*12.25*	12.62½	12.37½	12.55
Spelter, St. Louis	*4.65*	4.70	4.75	4.85
Lead, New York	**4.40**	4.60	4.25	4.10
Lead, St. Louis	**4.30**	4.45	4.17½	3.97½
Tin, New York	*27.50*	28.25	29.00	28.65
Antimony, Hallett, New York	**6.75**	6.75	6.25	7.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	*3.64*	3.64	3.79	3.79

Chicago.

FISHER BUILDING, February 3, 1904.—(*By Telegraph.*)

The leading jobbers, retailers and mill agents in Iron and Steel goods of various kinds have footed up their January business and find, rather to their surprise, that the business of the month was as much as that of November and December combined. The general sentiment seems to be that the year 1904, judged by the business of the first month of the year, will be one of a normal volume of transactions at prices that are more nearly normal than they were a year ago. Business is being carried on without the stress and excitement and without the loss that attended the feverish condition of a year ago. Labor costs are being brought down to a normal basis among the Western blast furnaces without very violent opposition on the part of their operatives. A crisis seems to be reached in Pig Iron, with every possibility that makers will be compelled to concede lower prices to large buyers or effect additional curtailments in their output. Only three stacks are in blast at this moment in this territory: one at Mayville, one Thomas at Milwaukee, and one Iroquois at South Chicago, the second Iroquois furnace being temporarily banked, to resume in a day or two. On the other hand, the supply of both Northern and Southern Iron very greatly exceeds the demand, and it is doubtful whether concessions in prices would greatly increase the business. Wire products are extremely active, the mills being filled to their utmost capacity. Plates are quiet and Structurals improving in both volume and character of business booked. Iron and Steel Bars are moving better than they have for a number of months, showing greater activity in specifying on the part of Agricultural Im-

plement manufacturers. Merchant Pipe has been advanced in price and seems to be the active seller. Rails and Track Supplies show an improved tone, particularly in the West and Southwest, where conditions of climate permit early spring operations.

Pig Iron.—Pig Iron producers are wavering, and a half hearted endeavor is being made to hold Northern Iron at the basis of $14 for No. 2, and Southern at $13.85 for No. 2, and in the absence of any inquiries of moment these prices hold nominally. There is no telling what would happen in case a large buyer came into the market for a good round lot of either Northern or Southern. Some sales of Southern Iron are already being made at $13.60, Chicago, but the conditions surrounding these sales are special in character and do not warrant us in naming that as a current price. It is generally felt in the trade that Iron buyers are not holding off for lower prices, but because their own orders are so slack that they have no occasion to buy Iron in any quantity. We repeat last week's prices without change, as follows:

Lake Superior Charcoal	$16.75 to $17.00
Northern Coke Foundry, No. 1	14.50 to 14.75
Northern Coke Foundry, No. 2	14.00 to 14.25
Northern Coke Foundry, No. 3	13.50 to 13.75
Northern Scotch, No. 1	15.00 to 15.25
Ohio Strong Softeners, No. 1	16.30 to 16.55
Ohio Strong Softeners, No. 2	15.80 to 16.05
Southern Silvery, according to Silicon	15.35 to 16.35
Southern Coke, No. 1	14.35 to 14.60
Southern Coke, No. 2	13.85 to 14.10
Southern Coke, No. 3	13.35 to 13.60
Southern Coke, No. 4	12.85 to 13.10
Southern Coke, No. 1 Soft	14.35 to 14.60
Southern Coke, No. 2 Soft	13.85 to 14.10
Foundry Forge	12.85 to 13.10
Southern Gray Forge	12.60 to 12.85
Southern Mottled	12.35 to 12.60
Alabama and Georgia Car Wheel	.... to 19.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	16.30 to 16.80
Jackson County and Kentucky Silvery, 6 to 10 per cent. Silicon	17.30 to 18.80
Basic Southern	14.35 to 14.85

Bars.—Iron Bars are still held quite firmly at 1.40c., with here and there a large buyer who claims that he can do $1 per ton less. The leading producer of Iron Bars has had an extremely large trade the month of January, exceeding any month previous in the history of that company, except March, 1902, during which month an exceptionally large tonnage was booked following a notice of prospective advance in prices at that time. Wagon makers are perhaps the largest buyers of Bars, and several 500-ton orders have been placed by Western wagon makers and a multitude of smaller orders from the same class of buyers. Implement manufacturers are specifying liberally at last on both Iron and Steel Bars. The good old fashioned winter which we have been having has given a new tone to the Implement business, as rural weather prophets are unanimous in declaring that a good crop follows a winter of this character. Demand for Hoops is growing better each week, though no conspicuously large tonnages have been placed. We quote: Iron Bars, 1.40c., base, half extras; Bar Steel, 1.46½c., base, half extras; Steel Bands, 1.46½c. rates, half extras; Steel Hoops, 1.71½c. rates, full extras. From store Iron Bars are being sold at 1.60c. to 1.75c., full extras, and Steel Bars at 1.60c. to 1.75c., half extras, the lower price in each case being only for business that is exceptionally desirable, and is only quoted to large customers who buy extensively from store. Steel Hoops from store are still offered at 2.10c. to 2.20c. rates, full extras.

Structural Materials.—The leading producers of Structurals announce semiofficially that their last week's business throughout the country exceeded that of any other week since January 16, 1903. No large contracts have been placed in Chicago during the last week, though quite a number of buildings ranging from 100 to 300 tons have been placed at a price averaging about 2½c. per lb. for the Finished Steel laid down ready to erect. We quote: I-Beams and Channels up to and including 15 inches and Angles 3 inches on one leg and larger, 1.76½c., Chicago; Tees, $1 per ton extra. Sales of Structurals are being made at 1.95c. to 2c. cut to lengths 5 feet and over, with here and there sales made at 1.90c. to large buyers.

Plates.—The leading local producer talks enthusiastically about the Plate business now being booked, though other interests are complaining of a dearth of business. We quote as follows: Tank Steel, ¼-inch and heavier, 1.76½c. to 1.86½c.; Flange, 1.86½c. to 1.96½c.; Marine, 1.96½c. to 2.06½c.; Universal Mill Plates, 1.76½c. to 1.86½c. From store Plates are selling at 2c. for Tank quality, ¼-inch and heavier; 2.10c. for 3-16; 2.15c. for No. 8; 2.20c. for No. 10, with 25c. per 100 lbs. for Flange quality.

Sheets.—This is one of the most difficult markets to epitomize, as no two mills follow the same differentials between gauges. In general, it may be said that heavier gauges are strong, with an upward tendency, and the lighter gauges are being forced down, owing to the keen competition on the part of the independent mills. In some quotations which follow, the very wide differences between minimum and maximum prices of each gauge represent the difference in the prices of competing interests. We quote as follows, in carload lots, Chicago: No. 10, 1.86½c. to 1.96½c.; No. 12, 1.96½c. to 2.01½c.; No. 14, 2.01½c. to 2.06½c.; No. 16, 2.01½c. to 2.16½c.; Nos. 18 and 20, 2.16½c. to 2.21½c.; Nos. 22 and 24, 2.21½c. to 2.26½c.; No. 26, 2.31½c. to 2.36½c.; No. 27, 2.36½c. to 2.41½c.; No. 28, 2.46½c. to 2.51½c.; No. 29, 2.56½c. to 2.61½c.; No. 30, 2.71½c to 2.76½c. From store Blue Annealed Sheets are being sold at the following prices: Nos. 8 and 10, 2.15c. to 2.20c.; No. 12, 2.20c. to 2.25c.; No. 14, 2.30c. to 2.35c.; No. 16, 2.40c. to 2.45c.; Nos. 18 and 20, 2.50c. to 2.55c.; Nos. 22 and 24, 2.55c. to 2.60c.; No. 26, 2.65c. to 2.70c.; No. 27, 2.75c. to 2.80c.; No. 28, 2.80c. to 2.85c.; No. 29, 2.95c. to 3c.; No. 30, 3.10c. to 3.15c. Galvanized Sheets in narrower sizes are being sold by independent mills as low as 80 and 5, f.o.b. mill, with 80 and 2½ offered at Chicago, but the large producers who are able to take orders for wide as well as narrow Sheets are holding pretty generally at 80 and 2½, mill, with 80 per cent. discount, Chicago, the lowest obtainable price. Galvanized Sheets are sold from store in small lots at from 75 and 5 discount to 75 and 7½.

Billets.—A few Forging Billets are being sold each week to jobbing shops in Chicago, Milwuakee and other Western cities, and to some of the leading agricultural implement manufacturers, although business in general may be said to be very quiet. No change in prices is noted, $24 being charged for either Forging or Rolling Billets either Bessemer or Open Hearth, in carload lots, Chicago, with $1 to $2 per ton more paid for smaller lots.

Cast Iron Pipe.—Business in Cast Iron Pipe is brightening up somewhat, with a multitude of small orders from gas companies and municipalities. No orders of any magnitude have been closed in this territory during the week though a number of round lots are being figured on. We quote: 4-inch Water Pipe, $27 per gross ton, in carload lots, Chicago; 6 to 12 inch Water Pipe, $26 per ton; Pipe larger than 12-inch, $25 per ton; Gas Pipe, $1 per ton higher.

Merchant Pipe.—Encouraged by the brisk business of January, the leading maker of Merchant Pipe has raised prices on sizes except 7 inches in diameter and larger by reducing discounts one point. This increase in price means that the company making it are recovering just half the concession that was made to the trade several weeks ago. This makes the ruling discounts to the trade as follows:

	Steel Pipe.— Black.	Galv.	Guar. Wrought Iron.— Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛ to ⅜ inch	67.35	57.35	64.35	54.35
½ inch	70.35	60.35	67.35	57.35
¾ to 6 inches	74.35	64.35	71.35	61.35
7 to 12 inches	69.35	59.35	66.35	56.35

Less than carloads, 12½ per cent. advance.

Boiler Tubes.—In the West the Boiler Tube business is largely a store business, and what mill business is done is done largely through the two large warehouse firms here. These firms report the Boiler Tube business as being excellent in comparison with other lines of Iron and Steel. No changes in prices have been made, the leading producer quoting the following discounts in car lots from mill, f.o.b. Chicago:

	Steel.	Iron.	Seamless steel.
1 to 1½ inches	42.35	38.85	53.35
1¾ to 2¼ inches	54.85	37.35	40.35
2½ inches	57.45	42.35	up to 4 in.
2¾ to 5 inches	63.35	49.85	48.35
6 to 13 inches	54.85	37.35	....

Prices from store on Boiler Tubes are the same as have been quoted for a number of weeks, as follows:

	Steel.	Iron.	Seamless steel.
1 to 1½ inches	40	35	37½
1¾ to 2½ inches	50	32½	35
2¾ to 5 inches	60	45	45
6 inches and larger	50	32½	..

Merchant Steel.—Considerable specifying has been done on old contracts, and a reasonably good amount of new business transacted by implement makers, who are coming into the market for requirements. Inquiries are good, and altogether the market may be said to be a strong one, but without change in prices, which are as follows: Open Hearth Spring Steel to the general trade, 2c. to 2.25c.; Smooth Finished Machinery Steel, 1.71½c. to 1.81½c.; Smooth Finished Tire, 1.66½c. to 1.76½c.; Sleigh Shoe, 1.51½c. to 1.61½c.; Cutter Shoe, 2.25c. to 2.35c.; Toe Calk Steel, 2.01½c. to 2.11½c.; Crucible Tool Steel, 6½c. to 8c.; Special Tool Steel, 12c. up; Shafting at 52 per cent. in car lots and 47 per cent. in less than car lots.

Rails and Track Supplies.—The 10,000-ton sale alluded to last week was made to the Soo road by the Lackawanna Steel Company for May and June delivery. None of the other large inquiries then referred to have been closed, though the leading Western mill sold about 10,000 tons last week to various interests, including 2000 tons each to the Los Angeles & San Pedro, to a territorial road from St. Louis and to an electric railway running out of San Francisco. The price of $28 per ton is supposed to be

on 500-ton lots or greater, with $30 per ton for single carlots and greater and $32 per ton for less than carloads, although there is little doubt that a buyer of 200-ton lots could secure the $28 price. There is a good deal of comment in this market about the rumored sale of 40,000 tons to the Canadian Pacific at $21.50 by the Pennsylvania Steel Company. It is also understood here that the Lackawanna have sold a very large tonnage to the New York Central. The demand for Light Sections continues active, but independent producers are not always able to secure $27 for heavier than 12-lb. Rails, as they had hoped to do. Light Rails are quoted more frequently at $25 to $26, at maker's mill, than higher. We make no changes in our quotations in Track Supplies: Angle Bars are being sold at 1.40c. to 1.50c. Spikes at 1.70c. to 1.80c., base, and Track Bolts at 2.50c. to 2.60c., base.

Old Material.—There is a feeling among both dealers and consumers of Old Material that the railroads will not be able indefinitely to hold their Scrap, and that when they do dump it on the market prices will weaken very materially. Already some roads are beginning to dispose of their accumulation of Scrap, usually, however, to dealers rather than to consumers, because the consumption of this material is very far below the actual supply. We make advances of 50c. per ton on Old Iron Rails, Old Steel Rails, Iron Fish Plates, Nos. 1 and 2 Railroad Wrought, Heavy Cast Scrap, Railroad and Agricultural Malleable. We quote as follows, per gross ton, Chicago:

Old Iron Rails	$16.00 to $16.50
Old Steel Rails, 4 feet and over	13.00 to 13.50
Old Steel Rails, less than 4 feet	11.00 to 11.50
Heavy Relaying Rails, subject to inspection	23.00 to 24.00
Heavy Relaying Rails, for side tracks	18.00 to 20.00
Old Car Wheels	13.50 to 14.00
Heavy Melting Steel Scrap	10.50 to 11.00
Mixed Steel	9.00 to 10.00

The following quotations are per net ton:

Iron Fish Plates	$13.00 to $13.50
Iron Car Axles	16.00 to 16.50
Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	12.00 to 12.50
No. 2 Railroad Wrought	11.00 to 11.50
Shafting	13.00 to 13.50
No. 1 Dealers' Forge	9.50 to 10.00
No. 1 Busheling and Wrought Pipe	8.50 to 9.00
Iron Axle Turnings	8.00 to 8.50
Soft Steel Axle Turnings	8.00 to 8.50
Machine Shop Turnings	7.50 to 7.75
Cast Borings	4.00 to 4.50
Mixed Borings, &c	4.00 to 4.50
No. 1 Boilers, cut	8.50 to 9.00
Heavy Cast Scrap	11.00 to 11.50
Stove Plate and Light Cast Scrap	9.50 to 10.00
Railroad Malleable	9.00 to 9.50
Agricultural Malleable	8.50 to 9.00

Metals.—Pig Lead has been checked in its rapid upward advance and is quoted 10c. per 100 lbs. lower than last week, the 50-ton lot price being 4.40c., with 4.45c. for car lots and 4.60c. to 4.75c. for ton lots and less. Pig Tin has dropped to 28½c. Casting Copper has lost another ⅜c., being quoted at 12⅝c., as against 13c. last week. Lake Copper is ½c. off, the present price being 12¾c. Spelter is unchanged at 4.85c. in car lots and 5.10c. in less than car lots. Sheet Zinc is unchanged at 5.65c. per lb. for car lots 600-lb. casks, with 20c. advance for less than car lots. In old metals, Copper and Brass have been slightly weaker, but in other kinds there has been no change from a week ago. We quote: Copper Wire and Heavy, 11⅝c.; Copper Bottoms, 10½c.; Copper Clips, 10⅜c.; Red Brass, 10⅜c.; Red Brass Borings, 8⅞c.; Yellow Brass, heavy, 8½c.; Yellow Brass Borings, 6½c.; Light Brass, 6c.; Heavy Lead, 4.25c.; Tea Lead, 3.85c.; Zinc, 3⅝c.; Block Tin Pipe, 24c.; Pewter, No. 1, 19c.

Tin Plate.—The reduction in Tin Plate announced editorially last week has resulted in considerable activity, though the knowledge that the leading producer has piled up an extremely large tonnage is not calculated to inspire a decidedly bullish feeling among buyers. The new price is $3.64 per 100-lb. box of 14 x 20 Prime Bessemer Coke Tin, f.o.b. Chicago, in car lots.

Coke.—Seventy-two-hour Connellsville Foundry Coke is being sold generally in this market at from $2 to $2.25 per ton at the ovens, which would be $4.65 to $4.90, Chicago, in carload lots. The Frick Company claim that they are holding their Coke at $4.50 at the ovens, or $5.15, Chicago, but it is doubtful if they are able to take business of any magnitude at that price. Furnace Coke is being bought by local blast furnaces at about $4.10, Chicago.

M. B. Austin & Co., Chicago, have been appointed sales agents for the Chicago territory for the National Wire Corporation, New Haven, Conn., vice R. B. Abbott, resigned. M. B. Austin & Co. are also agents for the Safety Insulated Wire & Cable Company of New York, with works at Bayonne, N. J.

Philadelphia.

FORREST BUILDING, February 2, 1904.

Conditions have not greatly changed during the past week. A fair amount of business has been done in Pig Iron, but there is an undefined impression that things are not improving, and that prospects in that direction are not encouraging. Prices are bad enough, but that might be regulated providing there was a goodly volume of business, but the tonnage is not there, and not likely to be in the very near future. It is difficult to account for this condition of affairs, and no satisfactory reasons can be given for the continued dullness, except that buyers are not taking more than about half of what they were doing during 1902 and the first half of 1903, on the ground that they have no use for more than that quantity. Production has been reduced so as to conform to the changed conditions, but the prices that are realized leave no margin for profit, so that it would be difficult to imagine a more unsatisfactory state of affairs than those that now exist—and the worst of it is, that there is no definite prospect of betterment. It appears to be impossible to get costs down to a point that would leave a reasonable margin for profit, and it is certain that prices cannot be advanced unless there is a much stronger demand than is expected. With little more than 50 per cent. production as compared with the first half of 1903, stocks have steadily increased, and as a considerable number of furnaces are to be fired during the next few weeks, it is difficult to see what will be done with so much Pig Iron. If a reduction in the price of Steel Rails is foreshadowed, the increase in furnace output can be understood, otherwise it is either a mistake or a mystery—or both. These remarks apply more especially to Pig Iron, but the conditions are not very much better in the more advanced products. Bar Iron is a shade stronger, and there is, perhaps, a little more business in Plates, Sheets and other specialties, but the volume is not nearly what is necessary to keep the mills profitably employed. The severe weather is somewhat inimical to business activity, but it is hoped that as spring approaches orders will come out more freely.

Pig Iron.—The market is hard to define, although it is certainly not improving. A fair amount of business has been done, and it cannot be said that prices were lower than during the week previous, but there is a constant fear that the next transaction will be at lower figures. Whatever strength there may be is due to the fact that there is no money in Pig Iron at present prices, and at less there would be a positive loss. Producers are therefore making desperate efforts to maintain quotations, and especially as prospects of lowering costs are somewhat remote. All the same there is plenty of Iron at current quotations, and unless the demand increases it will be hard to prevent further recessions. Reports from the Central West are decidedly poor, and as this territory is probably in relatively better condition than other districts, it will make it all the more difficult to withstand any prolonged strain. It is pretty well understood that present conditions cannot be continued much longer, so that by the middle of the month or soon after there must be a distinct turn for either better or worse; which it will be, time alone can tell. Southern Iron is no longer salable in this district at quoted rates, and as markets North and West are still less favorable for that class of Iron, it is not improbable that renewed competition may be met with from that source. At any rate the feeling is one of uncertainty and not without a good share of anxiety. For the present, however, prices remain as last quoted—viz., for Philadelphia and nearby deliveries about as follows:

No. 1 X Foundry	$15.50 to $16.00
No. 2 X Foundry	14.50 to 15.00
No. 2 Plain	14.00 to 14.25
Southern No. 2, rail shipment	13.75 to 14.00
Southern No. 2, on dock	13.00 to 13.50
Standard Gray Forge	13.50 to 14.00
Ordinary Gray Forge	12.75 to 13.25
Basic	13.75 to 14.00

Steel.—There is a good demand for small lots, but no one appears to be ordering more than will cover their immediate needs. Prices from $24 to $25, delivered according to quantity, analysis, &c.

Plates.—There is no appreciable change from the conditions recently noted. There is a fairly good demand for small lots, and occasionally a 1000-ton order can be had, but the total is not heavy enough to give general employment. There is a prospect of improvement as spring approaches, but no great activity is looked for in the immediate future. Prices steady and unchanged, as follows:

	Carloads. Cents.	Part carloads. Cents.
Tank Steel, ¼ inch and heavier	1.73½	1.78½
Tank Steel, 3-16 inch	1.83½	1.88½
Tank Steel, Nos. 7 and 8, B. W. G.	1.88½	1.93½
Tank Steel, Nos. 9 and 10, B. W. G.	1.98½	2.03½
Flange or Boiler Steel	1.83½	1.88½
Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½
Plates over 100 to 110 inches	.05 per lb. extra	
Plates over 110 to 115 inches	.10	"
Plates over 115 to 120 inches	.15	"

Plates over 120 to 125 inches	.25 per lb. extra
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "
All sketches (excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end be- not less than 30 inches)	.10 "
Complete Circles	.20 "

Shell grade of Steel abandoned.

Structural Material.—There is no special feature to notice in this department. Large orders are not around to any extent, but small and medium sized lots are taken pretty freely, but the mills could handle a great deal more work if they could get it. Prices unchanged, as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specification, and small Angles 1.50c. to 1.55c.

Bars.—There is a slight improvement in the demand for Bar Iron, and some betterment in prices, although there is still a good deal of irregularity. The higher prices for scrap material is partly responsible for the increased firmness in the finished article, although, even at the full quotation, there is not much money in the business. Prices vary from 1.30c. to 1.40c., delivered, for Refined Iron, most of the business being 1.35c.; Steel Bars, unchanged, at 1.43½c. to 1.50c., according to specification.

Sheets.—There is a good demand for Sheets and for the best makes prices are very steady. Ordinary Sheets, however, are dull and prices somewhat uncertain.

Old Material.—There is a good demand for most kinds of Scrap, but prices are not as strong as they were a week ago, although most of the advance is maintained. Bids and offers are about as follows:

Old Steel Rails	$12.15 to $13.25
Heavy Steel Scrap	12.50 to 12.75
Low Phosphorus Scrap, nominal	16.00 to 17.00
Old Steel Axles	16.00 to 17.00
Old Iron Rails	15.50 to 16.00
Old Iron Axles	18.00 to 19.00
Old Car Wheels	13.00 to 13.50
Choice Scrap, R. R. No. 1 Wrought	15.50 to 16.50
Country Scrap	13.50 to 14.50
Machinery Scrap	12.75 to 13.25
No. 2 Light Scrap	11.00 to 11.50
No. 2 Light (Ordinary)	9.00 to 9.50
Wrought Turnings	9.00 to 9.50
Wrought Turnings, Choice Heavy	10.00 to 10.50
Cast Borings	7.00 to 7.50
Stove Plate	11.00 to 11.50
Wrought Iron Pipe	11.50 to 12.00

Cleveland.

CLEVELAND, OHIO, February 2, 1904.

Iron Ore.—The situation in this territory has been complicated during the past week by the assertion made by some of the Iron Ore producers that the Ore on the docks and at the furnace stock piles will be sufficient to last until the first of next September. It is understood, of course, that the amount on the lake docks alone is not sufficient for such a purpose, and this gives the first indication of the quantity of material which is stored at the furnaces. It is understood that Lake Ore producers are disposed this coming year to reduce prices to a point which will considerably extend the territory tributary to the Lake Superior Ore supply beyond what it has been at any time during the past few years, with the possible exception of 1902, when about 4,000,000 tons were sent into new localities. The hope of regaining a hold on this larger field is coming to be a potent factor in the discussion that may result in lower prices this spring.

Pig Iron.—The buying of Pig Iron may be said to have improved to a certain appreciable extent without stiffening prices. Conditions have thrown all of the purchase of Iron for this territory into the hands of the Northern furnaces. The lots are getting to be a little larger, running from 50 to 300 or even 500 tons. The number of sales is also increasing satisfactorily. The buying for future delivery promises well. One or two inquiries for good sized lots are in, and it is now apparent that contracts are pending which, when closed, will amount to 6000 or 7000 tons. The furnaces are making concessions to get this advance business and are going pretty close to cost price, if not, at times, a little below it. There has been some little better inquiry for Bessemer and Basic, but no contracts have yet appeared, the lots being merely small ones brought out by the need of the smaller consumers. The market is not in a position to be quoted. The Coke market is a little stronger. The difficulty of making delivery and the increased demand caused by the better consumption are stiffening the market somewhat. Good Furnace Coke is selling at $1.50 to $1.60, at the oven. The best 72-hour Foundry Coke is selling at $2.25 to $2.50, at the oven, while High Sulphur Cokes are selling at $2 to $2.15. Pig Iron prices are quoted, f.o.b. cars, Cleveland:

Northern Coke, No. 1 Foundry	$14.00 to $14.25
Northern Coke, No. 2 Foundry	13.50 to 14.00
Northern Coke, No. 3 Foundry	13.00 to 13.75
Southern Coke, No. 1 Foundry	14.25 to 14.50
Southern Coke, No. 2 Foundry	13.75 to 14.00
Southern Coke, No. 1 Soft	14.25 to 14.50
Southern Coke, No. 2 Soft	13.75 to 14.00
Jackson County, 8 per cent. Silicon	.... to 17.45
Hanging Rock Charcoal, No. 1	.... to 23.45
Southern Charcoal, No. 1	20.00 to 20.50
Lake Superior Charcoal	16.50 to 17.00

Finished Iron and Steel.—The Sheet Steel trade has stiffened through the action of the independents. They had been cutting prices rather freely, making at times a reduction of $1 or $2 a ton on their product. At a meeting held during the past week it was decided that prices would have to be advanced, some sales having been made at less than cost. It is understood the association basis of prices was decided upon, but this action is independent of the influence of the association. The buying has been good and steady and the general tone has improved. What appears now to be a general basis of quotation is as follows: No. 27 Black Sheets out of stock, 2.50c.; No. 27, one pass cold rolled, in car lots at the mill, 2.35c.; No. 22 Galvanized Sheets, and lighter, 75, 10 and 2½ off list. For the heavier gauges of Galvanized Sheets 75 and 10 off list. The market also shows a very good buying movement of material for use in Agricultural Implement factories. Bars took the lead in that respect here. The Bar Iron market has grown to be much firmer. Prices are being held up, not so much by the strength of the market itself as by the necessity arising through the advancing price of Scrap. Bar Iron prices now hold pretty steady at 1.30c. at the mill on good specifications, while some is bringing as much as 1.35c. at the mill, where the lots are smaller. The demand for Bar Steel strengthens that market irrespective of the price of the raw or semifinished material. Specifications against former contracts have been especially satisfactory. Prices hold at 1.30c., Pittsburgh, for Bessemer and 1.40c., Pittsburgh, for Open Hearth. The Structural trade does not seem to rally quite as fast as some of the mill men have expected. It is evident that weather conditions have been responsible for much of the check. Indications point to fair buying soon. There has been a good demand for Boiler Tubes, but no special call for Plates. Specifications against Plate contracts have been heavier. In Rails and Billets nothing of importance has been done in this territory during the past week.

Old Material.—There has been a good call for Heavy Melting Steel recently. There is also a good demand for Busheling. The specialties seem to have assumed the center of the stage regardless of the attitude of the rest of the grades, where prices are purely nominal. The Cleveland prices, revised, are as follows, all gross tons: Old Steel Rails, $14 to $15; Old Iron Rails, $15 to $16; Old Car Wheels, $13.50 to $14.50; Railroad Malleable, $11.50 to $12.50; Heavy Melting Steel, $11 to $12; Cast Borings, $5. All net tons: No. 1 Railroad Wrought, $11.50 to $12.50; No. 1 Busheling, $10 to $11; Wrought Turnings, $6.50 to $7.50; Iron Car Axles (nominal), $17 to $18; No. 1 Cast Scrap, $11 to $12; Stove Plate, $9 to $10.

Birmingham.

BIRMINGHAM, ALA., February 1, 1904.

There was a lull in the buying of Iron during the past week. The majority of sellers reported a dull market, but there are a few cases where a more favorable condition of affairs was reported, the sales in volume being equal to the output. Quotations are yet on the basis of $10 for No. 2 Foundry. It was anticipated that some croaking would prevail and the expectation was realized. There were also reports that prices were being cut, and at least in one case the charge was made with positiveness that a very prominent interest was offering Iron to a leading Western market on the basis of $9 for No. 2 Foundry. The interest so accused, when the subject was mentioned to them, promptly submitted their sales sheets for the week to your correspondent. They most emphatically disproved the charge, as the record showed no entry below the basis of $10, regular, for No. 2 Foundry, and your correspondent was not satisfied with a cursory glance, but closely scanned the sales sheet. It should not be a matter of surprise if there was some cutting going on, for, in the present condition of the market, the temptation to run to cover by one not prepared to stand a rainy spell is almost irresistible. No one is now holding umbrellas over the other fellow, and every tub is standing on its own bottom.

The trade has been of the small kind, and the most of it was by due course of mail and from those who order at stated times and pay current value. There was a moderate lot of Silvery sold at $11, and some No. 1 Foundry went in a moderate way at $10.50. Some No. 1 Soft went at $10.50. Moderate amounts of No. 2 Soft were sold at $10, the same price at which No. 2 Foundry sold. No. 3 Foundry sold at $9.50 and a limited amount of No. 4 Foundry at $9. Gray Forge was sold at $8.50 and at $8.75, while some contend that it can be had at $8.25. But your correspondent is unable to locate the sellers. He is compelled to accept the figures on the sales sheets as representing the market values. The majority of the sales made are yet, in delivery, confined to the present quarter. But there were sales in a limited way for the second quarter, ranging on the basis of current value to 50c. above it. There were limited

sales on the basis of $10 for No. 2 Foundry, and there were also sales on the basis of $10.25, as well as some on the basis of $10.50 for No. 2 Foundry.

The prices made of late by some of the Northern furnaces have secured them the floor and the capture of the market. At the prevailing low level of values there is no money in the market for them and no temptation to compete for the business that can be secured. One gets tired mighty quick of a losing game, and this district seems willing to shift the burden of holding the bag. Experience is acquired, and it is the father of wisdom, as opportunity is its mother. Necessity sometimes forces prices below the foundation stones of a successful business, and quagmire losses are hard to reclaim.

The Steel mill is again actively at work, having all its battery of open hearth furnaces running. It is making rails at present to fill an order from the Louisville & Nashville Railroad to deliver at different points on that road. Things indicate that a continuous run for some time to come is anticipated.

Several months ago these letters mentioned the probability of the erection of another steel mill in this territory in the near future. It is now stated with a good deal of positiveness that parties are on the ground here for the business of locating the mill. The parties in the deal are the ones who made considerable investments around Boyles Station and who are now active in developing the mines of coal on the property they secured. It was part of their plan, as then stated, to erect several furnaces and also a Steel mill. While nothing absolutely positive can be learned of their intentions, the statement can be accepted as approximately correct.

There is something doing in connection with the erection of another Car Wheel plant, but affairs have not yet developed to the point where one can announce anything positive in relation to the enterprise. There is an air of probability about the deal that appeals to one's credulity.

In railroad circles there is much activity in the district. The grading for the round house and yards for the Southern Railway at North Birmingham is about completed. It will take about a month more to put on the finishing touches and turn over the work to the road. The Louisville & Nashville road is pushing the completion of new yards and shops at Boyles Station. When the roads take possession of these properties the congestion in the city limits will be relieved. In addition to these roads making large improvements here, the Seaboard Line will this month let a contract for a round house and freight depot. Some of the prominent officials were here during the past week on an inspection tour, and the construction department was well represented. They are pushing as fast as possible the building of the Atlanta link. Some time this year trains will be running over this road to Atlanta.

As to the meeting of the Southern furnace interests in New York the past week not much can be said in addition to what has been published concerning it. At a meeting to be held to-day those interested will appoint their respective experts to value their different properties, and when that is completed the chiefs will take up the matter and see how near to agreeing they can come. There has as yet been no definite plan mapped out as to how they will or can attain the object they have in view. The plan has yet to be evolved. The smaller interests are on the anxious seat as to the final result. If successfully accomplished there will be no more holding of the umbrella over the outsider. Opinion is divided as to the benefit or injury that the merger would be to this district.

Cincinnati.

FIFTH AND MAIN STS., February 3, 1904.—(*By Telegraph.*)

This week has been one of the *statu quo* variety. Everything has remained about stationary. There has been some buying right along, but it has had no distinctive character, as a little of everything has been bought for all kinds of shipment. It is evident that most of the purchasing now is for Iron that is needed to fill in, as it were. Northern prices remain at the recent low level—that is, $12.50, f.o.b. furnace, is quoted on No. 2, while Southern Iron, as when we last reported, is not quite as firm as the rock of Gibraltar. The most interesting transactions of the week have been several sales of Forge, both Northern and Southern, and there is some figuring being done on about 300 tons of Malleable Besemer, also for 10,000 tons of Southern Foundry, and two 500-ton lots are still pending. Sales of Mill Iron are welcomed by the Iron men as being a beginning of better times. There is also considerable demand for Basic, which is relatively higher and harder to get than any other kind of Pig Metal. One firm are at present figuring on from 8000 to 10,000 tons. Sellers seem to feel that part of the present dull times is owing to the unusual severity of the winter weather, and that as soon as there are any genuine signs of spring a change for the better will come. Freight rates from Hanging Rock district to Cincinnati, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$13.00 to $13.25
Southern Coke, No. 2	12.25 to 12.75
Southern Coke, No. 3	11.75 to 12.25
Southern Coke, No. 4	11.25 to 11.75
Southern Coke, No. 1 Soft	12.75 to 13.25
Southern Coke, No. 2 Soft	12.25 to 12.75
Southern Coke, Gray Forge	11.00 to 11.50
Southern Coke, Mottled	10.75 to 11.00
Ohio Silvery, No. 1	16.15 to 16.65
Lake Superior Coke, No 1	14.15 to 14.40
Lake Superior Coke, No. 2	13.65 to 13.90
Lake Superior Coke, No. 3	13.15 to 13.40

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$18.75 to $19.00
Lake Superior Car Wheel and Malleable	18.75 to 19.00

Coke.—The market for this commodity remains practically the same, with demand limited. There is more than enough to easily take care of all purchasers, with prices about as they have been for some time past. We quote, at ovens, West Virginia Coke, from $2 to $2.25; Connellsville Coke, $2 to $2.25.

Plates and Bars.—Bars are firmer, and inquiries are good, with quite a number of sales. Very little call is had, however, for Plates and other Structural Iron, and the market in this department is extremely quiet. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.75c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.43c., with half extras; the same in smaller lots, 1.80c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 2c.; Sheets, 16-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; 14-gauge, in carload lots, 1.95c.; in smaller lots, 2.50c.; Steel Tire, ¾ x 3-16 and heavier, 1.63c., in carload lots.

Old Material.—There is absolutely nothing doing in this class of material. Dealers are very much dissatisfied with the outlook, and are wondering when a change for the better will come. Prices remain the same, with a plentiful supply on hand. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, $10.50 to $11 per net ton; No. 1 Cast Scrap, $10 per net ton; Iron Rails, $13 to $14 per gross ton; Steel Rails, rolling mill lengths, $10 per gross ton; Iron Axles, $15 per gross ton; Car Wheels, $11 per gross ton; Heavy Melting Scrap, $10.50 to $11 per gross ton; Low Phosphorus Scrap, $11.50 to $12 per gross ton.

Pittsburgh.

PARK BUILDING, February 3, 1904.—(*By Telegraph.*)

Pig Iron.—The Pig Iron market remains in a quiet condition, and while there is a fair amount of inquiry, consumers are placing orders only for small tonnage, believing that it is not a favorable time to contract ahead. Reports of sales of 300,000 tons of Pig Iron by M. A. Hanna & Co., Cherry Valley Iron Company and other interests are utterly untrue, as no such sales have been made. The idle blast furnaces in the Pittsburgh and Valley districts are gradually getting started. The Carnegie Steel Company have started up no less than 18 stacks since January 1, and are getting ready to blow in Niles and also another Ohio stack at Youngstown. Bessemer Iron is held at about $13, Valley furnace, or $13.85, Pittsburgh, and the market is fairly firm at this price. It is possible that on a firmer offer and a good sized tonnage a little better could be done. There is considerable weakness in the prices of Foundry Iron, and Northern brands of Soft No. 2 are freely offered at $12.50, Valley furnace, or $13.35, Pittsburgh. On several long time contracts, deliveries running through this year, a lower price has been made. No Southern Iron is coming into this market, as the Southern furnaces are holding No. 2 at $10, Birmingham, equal to $14.35, Pittsburgh, and this is a prohibitory price in this market. The same is true of Southern Forge, which is held at $8.75, Birmingham, or $13.10, Pittsburgh, while Northern brands of Forge can be had at $12.75, Pittsburgh, or lower.

Steel.—We can state that specifications on contracts for both Billets and Sheet Bars are coming in more liberally than for some time, and shipments of Steel from the mills are heavier. Very little Steel is being sold at pool prices, nearly all consumers being covered by contracts based on the price of Bessemer Iron under which Bessemer Billets are furnished at $20.50 to $21; Open Hearth Billets, $21 to $21.50, and Sheet and Tin Bars at about $22. Pool prices on Bessemer and Open Hearth Billets are $23, Pittsburgh, and Long Sheet and Tin Bars, $23.50.

Sheets.—Reports, emanating from Cleveland, that the independent Sheet manufacturers had advanced prices $2 a ton are misleading. The Independent Manufacturers' Association met in Pittsburgh last week and appointed a committee to confer with officials of the American Sheet & Tin Plate Company with a view to having uniform prices on Sheets. A few of the independent mills that were shading the prices of the leading interest agreed to discontinue this and have advanced their prices to correspond with those of the American Sheet & Tin Plate Company. This probably gave rise to the report that a general advance of $2 a ton had been made in price of Sheets.

(By Mail.)

Sensational reports in the daily press to the effect that Cherry Valley Iron Company, M. A. Hanna & Co. and Kittanning Iron & Steel Mfg. Company had jointly sold 300,000 tons of Pig Iron for delivery this year are untrue and entirely without foundation in fact. Such reports as these do an injury in the trade and are to be regretted. The only possible foundation for such a report is that some months ago M. A. Hanna & Co. and Cherry Valley Iron Company sold a round tonnage of Bessemer Iron to the Republic Iron & Steel Company, deliveries running through this year. The Pig Iron trade continues somewhat quiet and without special features, with the exception that an inquiry is in the market for 6000 tons of Bessemer Iron for export. Some of the Valley furnaces are figuring on it, but if the business is secured it will probably go at a low price. On the whole, prices of Pig Iron are weak, especially on Foundry, Northern brands of No. 2 being freely offered at $12.50, Valley, with several sales for extended delivery reported at a lower price. While the Steel market is somewhat quiet, yet some of the finishing mills allied to the United States Steel Corporation report a shortage in Steel, due to the shutdown of plants on account of high water and other causes. Consumers who have contracts for Steel are specifying quite liberally, and shipments from the mills are heavier than for some time. The situation in Finished Iron and Steel is undoubtedly much better, demand for some lines, such as Plates, Steel Bars, Pipe and Wire products, being quite heavy. A readjustment in prices of Pipe has been made carrying a slight advance. The Wire mills are full of work, and in a few cases premiums for prompt delivery of Wire Nails have been paid. The price agreement on Hoops and Bands has been terminated, and the price of Hoops has gone off about $2 a ton.

Steel Rails.—We are advised that several good sized contracts for Rails have been placed in the past week by Western railroads, and that considerable other tonnage is pending which is expected to be placed within a short time. The report is confirmed that the Pennsylvania Steel Company have sold 40,000 tons of Rails to the Canadian Pacific Railroad. We quote at $28 at mill for Standard Sections, but if this price were lowered in the near future it would not be surprising.

Muck Bar.—The market continues quiet, and we do not hear of any sales in this district. We quote Standard grades of Muck Bar at $24.50 to $25, Pittsburgh.

Ferromanganese.—The local producer is not offering Ferro in the open market at the present time, but is taking care of regular customers that have contracts. We quote Domestic Ferro at $45, but on a firm offer this price would be shaded. English Ferro can be delivered at about $44 in the Pittsburgh district.

Hoops and Bands.—The price agreement on Hoops and Bands in force among three leading mills for some time has been terminated, and Hoops have gone off about $2 a ton. We quote Steel Hoops at 1.50c. in carloads and Bands at 1.30c., extras as per Steel card. No price has yet been fixed on Cotton Ties and probably will not be for some little time, as this trade has not yet started.

Sheets.—At a meeting of the Independent Sheet Manufacturers Association, held in Pittsburgh last week, a committee was appointed to confer with officials of the American Sheet & Tin Plate Company, with a view of maintaining present prices of Sheets. We may note that demand for Sheets is fairly active, consumers showing more disposition to contract ahead. The mills are entering a good deal of tonnage and the outlook for the Sheet trade is regarded as fairly satisfactory. We quote No. 26 Black Sheets, box annealed, one pass through cold rolls, at 2.10c. to 2.15c., No. 27 at 2.15c. to 2.20c. and No. 28 at 2.25c. to 2.30c., f.o.b. cars at mill. These lower prices on Sheets are made only on desirable specifications and for large lots. Galvanized Sheets are generally quoted at 80 and 2½ per cent. off, but for desirable orders 80 and 5 per cent. is being done. In net prices the latter discount is equal to 2.85c. for No. 26, 3.04c. for No. 27 and 3.23c. for No. 28. These prices are for carloads or large lots, f.o.b. at mill.

Plates.—We are advised by several of the leading mills that tonnage in Plates in the past week has shown considerable betterment, and it is believed a better demand has set in and will be permanent. Inquiries from the general trade are much better, and the fact that prices are guaranteed against decline should have the effect of causing buyers to place orders quite freely. On the lighter gauges of Plates, not ordinarily rolled by the Plate mills, some cutting in prices is being done. We quote: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches in width, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, $2 extra; gauge Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Structural Material.—The largest local contract in the market at the present time is a large warehouse to be built by the River & Railroad Terminal Company, presumably a Wabash interest, on the South Side, this city, which will take 13,000 to 14,000 tons. This job is being figured on, and is expected to be closed within a month. H. C. Frick has started the work of dismantling the cathedral, and it will probably be replaced by a large hotel, to be built on modern lines, and which is one of Pittsburgh's greatest needs. It is expected to require from 7000 to 8000 tons of Steel. Small contracts are fairly numerous, but the Structural trade, as a whole, is disappointing, capital being somewhat timid about taking up new enterprises at the present time, in the belief that by waiting they may have the benefit of lower prices. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c. On the smaller sizes of Angles there is some irregularity in prices, as these are rolled by a number of small mills that have limited tonnage, but which cut under prices just enough to get business.

Iron and Steel Bars.—We are advised that tonnage in Steel Bars is picking up to some extent, but as a rule consumers continue the policy of placing orders only for actual needs. Demand for Iron Bars is considerably better, and the leading interest is reported to be quite full of work. We quote Common Iron Bars at 1.30c., at Mill, for ordinary specifications, but for specially desirable orders possibly a little lower figure would be named. We quote Steel Bars at 1.30c., Pittsburgh, in carloads and larger lots. For quantities less than 2000 lbs. and not less than 1000 lbs. the price is 1.40c., and for less than 1000 lbs. the price is 1.50c.

Merchant Steel.—Very few contracts are being placed, and actual tonnage is confined to small lots for actual needs. Prices are only fairly strong, and concessions on desirable orders are obtainable. We quote: Tire Steel, 1.50c., base, for usual sizes; Toe Calk, 1.85c., base; Sleigh Shoe Steel, 1.45c. to 1.50c.; Open Hearth Spring, 1.90c. to 2c.; Cutter Shoes, tapered and bent, 2.25c. The above prices are for carload lots at mill, the usual differentials being charged for small lots. Tool Steel is 6c. to 8c. for ordinary grades. Prices on Shafting are firm on the basis of 52 per cent. off in carloads and 47 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—We note a fair demand for Spikes, the railroads placing orders a little more freely than for some time. We quote at $1.70 to $1.75 per 100 lbs., f.o.b. Pittsburgh.

Spelter.—Demand continues quiet and prime grades of Western Spelter are held at about 4.75c., Pittsburgh, for prompt shipment.

Wire Rods.—The great activity in the Wire and Wire Nail trade is causing some demand for Rods, which we quote at $30, Pittsburgh, for Bessemer and Open Hearth. A local mill that is usually a seller of Rods is out of the market, using its entire output in the manufacture of Wire products.

Skelp.—The market has shown considerable improvement, demand for Skelp being more active, and prices are very firm. We are advised of sales of fully 10,000 tons of Grooved and Sheared Iron Skelp in the past week, deliveries extending over the next three or four months. We quote Grooved Iron Skelp at 1.45c. to 1.47½c. and Sheared at 1.52½c. to 1.55c., at mill.

Merchant Pipe.—The condition of the Pipe trade is referred to by the leading mills as being very satisfactory, new tonnage being large and indications pointing to a heavy demand this year. The leading interest is operating its various Pipe mills to full capacity, and the other large outside mills are also quite busy and report an active demand. A slight advance has been made in some sizes of Merchant Pipe, and we have rearranged discounts to consumers in carloads, which are now as follows:

Merchant Pipe.

	Steel.		Iron.	
	Black.	Galvanized.	Black.	Galvanized.
⅛, ¼ and ⅜ inch	70	60	67	57
½ inch	73	63	70	60
¾ to 6 inches	77	67	74	64
7 to 12 inches	71	61	68	58
Extra Strong, Plain Ends:				
⅛ to 8 inches	69	59	65	55
Double Extra Strong, Plain Ends:				
⅛ to 8 inches	61	51	57	47

Boiler Tubes.—There is a fair tonnage moving, and prices are fairly firm, but are shaded more or less for desirable orders. Discounts to consumers in carloads are as follows:

Boiler Tubes.

	Steel.	Iron.
1¾ to 2¼ inches	55½	38
1¾ to 2½ inches	55½	38
2½ inches	58	43
2¾ to 5 inches	64½	50½
6 to 13 inches	55½	38

Iron and Steel Scrap.—The activity of a week or two ago in the Scrap trade has quieted down and demand is quiet. We quote: Heavy Melting Scrap, $13 and $13.50, gross tons; No. 1 Wrought Scrap, $14, gross ton; Steel Rails, short pieces, $13 and $13.50, gross tons; Rerolling Rails, $15, gross tons; Machinery Cast Scrap, $12.50 and $13, gross tons; Cast Iron Borings, $5.50 and $6, gross tons; Turnings, $7.50 and $8, gross tons; Busheling Scrap, $10 and $10.50, net tons.

Connellsville Coke.—The resumption of so many blast furnaces has caused quite an active demand for Furnace Coke, while demand for Foundry Coke is also heavy, and the Coke trade is in much better condition than for several months. Last week nearly 2000 more ovens in the Connellsville region were started up, and more ovens will be put in operation this week. Out of 28,000 ovens in the Upper and Lower Connellsville regions about 18,000 were active last week, the largest number for some months. Strictly Connellsville Furnace Coke for prompt shipment can be bought at about $1.50 a ton, but on contracts for extended delivery the leading operators quote $1.60 to $1.65 a ton. Strictly Connellsville 72-hour Foundry Coke is held at $2.10 to $2.25 a ton, at oven.

St. Louis.

CHEMICAL BUILDING, February 3, 1904.—(*By Telegraph.*)

Pig Iron.—A survey of the affairs in the Pig Iron market the past week does not reveal any very distinct progress. Inquiry continues to show, and also limited orders for quick Iron come to hand, but consumers' attitude in the matter of important transactions is still a waiting one. Prices are unchanged and we continue to quote, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry	$13.50 to $13.75
Southern, No. 2 Foundry	13.00 to 13.25
Southern, No. 3 Foundry	12.50 to 12.75
Southern, No. 4 Foundry	12.00 to 12.25
No. 1 Soft	13.50 to 13.75
No. 2 Soft	13.00 to 13.25
Gray Forge	11.75 to 12.00
Southern Car Wheel	19.50 to 20.00

Bars.—Business in the Bar market with the jobbers has been well maintained since last report. In lots from warehouse or store 1.55c. to 1.65c. for Iron Bars and 1.70c. to 1.75c. for Steel Bars.

Angles and Channels.—Trade has shown steadiness and is maintained on about the same basis as that of previous weeks. Small Angles and Channels at 2c., base, in lots from store.

Pig Lead.—The probability of further manipulation in prices by the most important interests in the East has perhaps been the pronounced factor controlling the market the past few days. Little decided activity, with offerings nominally 4.30c. for Missouri brands.

Spelter.—Conditions point to steadiness, with a moderate run of transactions on price basis of 4.65c.

The New York Machinery Market.

NEW YORK, February 3, 1904.

Improvement in machinery business has not come as satisfactorily as was expected. Basing their hopes on the tone and character of inquiries received last month, members of the trade predicted a comfortable amount of business for this month. The promises of betterment have continued to multiply, but the promised improvement has failed to materialize. In almost every instance the expected orders seem to be held back by the financial interests in the concerns involved. The works, managers or those connected directly with the manufacturing end of establishments need additional equipment, and have made their wants known in many cases to the extent of obtaining quotations from manufacturers and dealers. When they place the matter before the financial heads of their concern for their approval, however, they meet with indecision. In some instances they have again decided to withhold the desired plant improvements for a time. An illustration of this is found in the case of the General Electric Company. It is now said in the trade that this concern have decided to withhold purchases for the time being. One of the financial interests of this company is quoted as saying that their works have a productive capacity of $40,000,000 a year, and that the company are going to feel pretty well satisfied that the year will bring that amount of business before any further orders are placed for machinery to increase this capacity.

The Power Mining Machinery Company, 52 William street, New York, have completed the specifications for the equipment for the large additions to be made at their Holthoff plant, at Cudahy, Wis., and we are informed that they will be sent to the trade either the latter part of this week or the first of next. They are now in the hands of the superintendent at Cudahy for revision, and are expected East every day. While we cannot give details, we can state that the specifications cover a full machine shop equipment, and probably include several cranes. The company have recently purchased a 20-ton crane, with 36-foot span, from Pawling & Harnischfeger, Milwaukee, Wis. The contract for the new building has been let. It will be used as a machine shop, and will be 160 x 300 feet. Last November the company placed orders for a substantial consignment of machine tools in the West, but it is expected that the New York houses will receive their share in this next lot, as the orders are to be placed from this end.

A large plant for the manufacture of gas and gasoline engines is to be erected by the Hogan Motive Power Company, New Haven, Conn. A site has been selected, and work will be started within the next ten days on a one-story building, 50 x 200 feet, which will be equipped throughout with modern machinery. The company were organized last April with a capital stock of $100,000, and will build engines from the plans of John J. Hogan, formerly electrical engineer in charge of the Yale psychological laboratory, and inventor of the chronoscope in use by the large railroad systems. The officers are: John J. Hogan, president and general manager; G. Edward Osborn, vice-president and general sales agent; L. F. Miller, secretary, and W. J. Connor, treasurer. Among those financially interested are J. O. Handy of H. L. Handy & Co.; Lewis Harrison, treasurer of the American Steam Generator Company, New York; N. F. Berry, formerly with the Barney & Berry Skate Company, Springfield, Mass.; Frank W. Edmunds, New York, and Herman Schlissel, New Haven, Conn.

While it is not yet known just what new machinery will be required, it is probable that a good sized lot of foundry equipment will be needed by Alex. Miller & Bro., engineers, machinists and boiler makers, Jersey City, N. J., whose foundry at the north side of Morris street was recently destroyed by fire. The building was 75 x 100 feet, and is to be rebuilt as quickly as possible. Though this loss will inconvenience the firm to a considerable extent, their shop on the south side of the street was not injured, and they are ready to serve their customers as heretofore, especially in all classes of repair work.

The contract for the round house equipment at St. Louis, Mo., for the St. Louis, Kansas City & Chicago Railway has been secured by John Volk & Co. of Rock Island, Ill. The contract embraces a round house, machine shop, one-story, 50 x 125 feet, and 20 pocket coal chutes, approximating a cost of $40,000. A similar contract has been taken by the same company at Eldon, Mo., for the above named road.

Joseph T. Ryerson & Son of 17 State street, New York, have been retained by the Cleveland Punch & Shear Works Company of Cleveland, Ohio, as their sole selling agents. They report gratifying results in the exploitation of the punches, shears, bending rolls, planers, presses, hammers, boiler makers' tools, &c., produced by the Cleveland Company.

Secretary Moody has asked an appropriation from Congress sufficient to lay the foundation of the naval station at Olongapa, on Subig Bay, in the island of Luzon. The appropriation asked is $862,000, of which the largest item is $500,000 for a coaling plant.

The following awards have been made for supplies for the New York Navy Yard, bids for which were opened December 29:

Hendy Machine Tool Company, Torrington, Conn., class 13, two tool room lathes, $870.

Montgomery & Co., New York, class 14, three tool room lathes, $1080.

Prentiss Tool & Supply Company, New York, class 15, one tool room lathe, $510; class 19, two bed extension lathes, $2978; class 21, one band saw, $124.

Niles-Bement-Pond Company, New York, class 22, one turret lathe, $1325; class 27, one milling machine, $884.

Bement, Miles & Co., Philadelphia, class 29, one horizontal boring and drilling machine, $949.

Fitchburg Machine Works, Fitchburg, Mass., class 20, one forge engine lathe, $6075.

Garvin Machine Company, New York, four portable drills with motors, $1055.

Manning, Maxwell & Moore, New York, class 17, one pattern maker's lathe, $127; class 18, two-bed extension lathes, $2318; class 26, one cutting off machine, $399.

S. A. Woods Machine Company, Boston, Mass., class 24, one shop surfacer, $350.

Fairbanks Company, New York, class 25, one portable boring machine, $396.

Classes 12, one concrete mixing machine, and 28, one milling machine, will be purchased in open market.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until February 23 for the following supplies for the Mare Island and Puget Sound navy yards:

Class 18. One 16-inch lathe.
Class 19. One 30-inch lathe.
Class 20. One shearing machine.
Class 21. One 2-inch single bolt cutter.
Class 22. One automatic knife grinder.
Class 23. One hand planer and jointer.
Class 24. One polishing lathe.
Class 25. Sixteen-inch buffing and polishing wheels.
Class 26. Two electric motors.

A project, which is attracting considerable attention in the trade, is the new plant which is to be constructed by the Goubert Mfg. Company of 85 Liberty street, New York. The company's business in feed water heaters, steam separators and specialties, has outgrown their present plant, and instead of enlarging it the company have decided to erect a complete new plant at Bayonne, N. J. It will be located on the north side of Avenue C, and will reach to Third street, extending from Newman avenue to Humphries avenue in the opposite direction. The new works will be thoroughly modern in every respect, and will be the culmination of a great deal of investigation and planning on the part of August A. Goubert, the president of the company, who has given the subject of advanced factory construction and equipment much study. The idea of continuous process in manufacture will be borne out as far as it is possible in the case of this particular line of production. In addition to the manufacture of their own line, the company will embark in the jobbing foundry business on a rather extensive scale, equipping this branch of their new works for the production of large castings, such as engine cylinders and marine engine work. This portion of the business will be in charge of D. G. Moore, who was formerly with the Crescent Iron Works of Elizabethport, N. J. There will be four foundry buildings, one being 70 x 310 feet, and three, each 60 x 310 feet. They will have a capacity of about 50 tons a day at the outset, employing four cupolas. The large building will contain a 40 and a 25 ton electric traveling crane, and each of the other buildings will have a 25-ton traveler. The machine shop will be 90 x 400 feet. The equipment will be operated electrically, the larger tools being driven by individual motors, and the smaller ones by line shafting operated by electric motors. The power will be generated in an isolated power station, having a 300 horse-power direct connected compound engine running noncondensing. The boilers, which will be of the water tube type, will be equipped with superheaters. There will also be a blacksmith shop and plate shop, and various other small buildings for storage, pattern making and similar purposes. Particular attention will be paid to the handling of materials, industrial railways being furnished to connect the buildings and supplement the crane and railroad service, as a spur of the Central Railroad of New Jersey will be run to the works. The plant will be located on the water front, and excellent docking facilities will be provided. It is the purpose of the company to award contracts immediately, so that the work can be begun without delay.

Secretary of the Navy Moody in his recommendations before the House Committee on Naval Affairs presented two plans prepared by the General Board of the Navy as the building programme for next year. The first was based on an expenditure of $34,000,000, and included provision for one battle ship, one armored cruiser, three protected cruisers, four scout cruisers, two squadron colliers and two submarine boats. The second plan provides for an expenditure of $30,000,000, and is a duplicate of the first programme with the elimination of two of the scout cruisers. The Secretary recommended building naval stations at Guantanamo, Cuba, and Subig Bay, Philippine Islands. The station in Cuba ultimately is to cost $12,000,000, and the one in the Philippines $9,000,000; $1,000,000 is asked this year for the Guantanamo station, and a little less than that amount for the one in the Philippines.

The Power & Mining Machinery Company, New York, have recently received an order from the Elmira Water, Light & Railroad Company, Elmira, N. Y., for a 4-cylinder Crossley gas engine of the opposed type, with cylinders 32 inches in diameter by 36 inches stroke, to run 138 revolutions per minute, and to develop, under normal load, 1300 brake horse-power with natural gas containing 1000 B. T. U. per cubic foot. This engine will be direct coupled to a General Electric 60-cycle alternator of the fly wheel type, and will run in parallel with their existing steam engines and with such other gas engines as they may install in the future. It will be used for both lighting and power; the direct current for their railway work will be secured by the use of rotary converters. Other recent orders for Crossley gas engines and gas apparatus include the Milford Electric Light Company, Milford, N. H., one 80 brake horse-power high speed gas engine, with cylinders 17 x 24 inches, and one Crossley suction type producer plant of the same capacity; the Motor Engine Company, 15 William street, New York, one 20 brake horse-power Crossley new type suction gas producer, to be installed at their Staten Island shops; the Amparo Mining Company, Philadelphia, Pa., one 190 brake horse-power high speed double cylinder gas engine, with cylinders 18½ x 24 inches, and two high speed single cylinder gas engines, of 130 brake horse-power each, with cylinders 20 x 30 inches; six 9 x 15 foot Loomis generators, with two 10,000 cubic foot holders, crushers, Buckner roasting furnaces, condensing chambers and other mining machinery; the International Steam Pump Company, New York, for installation at their new plant at Harrison, N. J., two 11 x 16 foot Loomis-Pettibone gas generators, together with two 10,000 cubic foot holders, for metallurgical work; the Nogales Copper Company, Chicago, Ill., for installation in Mexico, three high speed double cylinder gas engines, 330 brake horse-power each, with cylinders 25 x 30 inches, and one high speed single cylinder gas engine, with cylinder 18½ x 27 inches, four 9 x 15 foot Loomis-Pettibone gas generators, one 10,000 cubic foot holder and one 5000 cubic foot holder, and mining machinery; the Sayles' Bleacheries, Saylesville, R. I., one 255 brake horse-power two-cylinder 22 x 30 inch high speed gas engine. At this plant the water gas, generated by the Loomis-Pettibone system, is in use for heating the singeing machinery and the producer gas in the gas engines. The new engine is to run in parallel with another gas engine which has been running at the Sayles' Bleacheries for over a year.

Vaux & Co., 257 Pearl street, Buffalo, N. Y., heating and ventilating engineers, are desirous of obtaining figures for galvanized iron work, boiler and pipe covering for their Government contracts for the Lockport, N. Y., Post Office; army quarters, at Fort Ontario, N. Y., and the barrack buildings, at Washington, D. C.

The A. E. Holaday Mfg. Company, New Haven, Conn., are in the market for additional machinery for the extensions now being made to their plant. They have recently increased their capital stock from $20,000 to $50,000, and are building an addition to the present building, with a frontage of 38 feet, and will make the entire structure two stories high. When these additions are completed, the company will increase their force 50 per cent., and will be in position to handle any business for overhead supplies for electric railways.

The National Motor-Auto-Boat Exposition.

The first American exhibition of pleasure boats moved by screw propellers, and measuring from 15 to nearly 50 feet long, will be opened Monday, February 8, in the new Herald Square Exhibition Hall, Broadway and Thirty-fourth street, New York. This exhibition will be open to the public from 10 a.m. to 11 p.m., closing Saturday, February 20. There will be musical concerts every afternoon and evening and other attractions, besides the many exhibits, including machinery in motion.

Among the exhibitors and those interested are Standard Engine Company, Fairfield Motor Company, Isham Motor Company, Palmer Bros., Cushman Motor Company, Carley Life Float Company, Fairbanks, Morse & Co., Richardson Engineering Company, Yacht Gas Engine & Launch Company, Newbury & Dunham, Victor Metals Company, Whitestone Boat Company, Clifton Motor Company, Smith & Mabley, Lozier Company, Old Town, Maine, Boat Company, Fairbanks & Co., Matthews Boat Company, Racine Boat Mfg. Company, Engelhardt Collapsible Life Boat Company, Robert Jacob, Morrison Life Belt Company, Lane and De Groot, National Mfg. Company, Western Engine Company, J. H. Perrine, Reliance Kerosene Motor Company, Stamford Motor Company, A. J. Tower & Co., Marblehead Yacht Yard, Chas. D. Durkee & Co., Pneumatic Mattress & Cushion Company.

The Southern Consolidation.—Only one step has thus far been taken in the movement to bring together the Tennessee Coal, Iron & Railroad Company, the Sloss-Sheffield Steel & Iron Company and the Southern properties of the Republic Iron & Steel Company. The Boards of Directors of these companies have authorized, not without some dissent, the appointment of one expert each to examine and report on the coal properties of each of the companies. The subject of the ore properties and the plants has not yet been taken up.

The Goldschmidt Thermit Company have been organized to exploit the alumino-thermit process in this country. The president is Dr. Hans Goldschmidt of Essen, Germany, and the vice-president and treasurer is E. Stuetz of the Wall Street Exchange Building, New York.

The iron founders of Buffalo are talking of shutting down, pending an adjustment of molders' wages.

Iron and Industrial Stocks.

The market during the past week displayed a declining tendency, in sharp contrast with conditions during the greater part of January. The most pronounced decline occurred in the case of Colorado Fuel and the United States Steel stocks. The highest and lowest prices on stocks showing fluctuations of more than a point were as follows: American Can preferred 36½ and 34½; Car and Foundry common 20¾ and 19¼, preferred 71 and 68¾; Locomotive common 22½ and 20⅝; Cambria Steel 21 and 19⅛; Colorado Fuel 34 and 30¼; Crucible preferred 27⅜ and 25½; Pressed Steel common 33 and 30½, preferred 72½ and 71½; Railway Spring common 23¼ and 22; Republic preferred 46 and 44; Sloss-Sheffield common 39 and 37; Tennessee Coal and Iron 40⅜ and 37; United States Steel common 11⅝ and 10½, preferred 57¾ and 54¼; new 5's 74⅝ and 71¾. The last prices on active stocks up to 1.30 p.m. on Wednesday, were as follows: Car and Foundry common 19, preferred 68⅞; Locomotive common 21, preferred 78½; Colorado 31; Pressed Steel common 30½, preferred 71½; Railway Spring common 23, preferred 74; Republic common 7¼, preferred 44½; Sloss-Sheffield common 37, preferred 79¼; Tennessee 36¼; Steel common 10⅝, preferred 54½; new 5's 71¾.

The governors of the New York Stock Exchange have struck off their list the common and preferred stock of the American Steel Foundries, alleging "misrepresentations of an important character relating to the financial condition of the company," when application was made in November, 1902, for the listing of the stocks. The company make the following statement in defense: "The original statement filed with the Stock Exchange on the application to list the stock shows a mistake in the current assets as shown in the balance sheet. The cash and cash assets item of $1,324,748 was an overstatement by $500,000. This mistake arose probably through a misunderstanding of the public accountants, and was brought about by a change of ideas on the part of the originators of the company as to working capital."

The quarterly statement of earnings of the American Car & Foundry Company shows that for the three months ended November 30 last the net earnings fell below those for the same period in 1902 by $590,760. The statement compares as follows with the figures for 1902:

	1903.	1902.
Net earnings	$1,561,485	$2,152,245
Dividend preferred stock	525,000	525,000
Balance	$1,036,485	$1,627,245
Dividend common stock	150,000	300,000
Surplus	$886,485	$1,327,245
Previous	11,159,292	9,832,047
Total surplus	$12,045,777	$11,159,292

The Pressed Steel Car Company.—Following is the statement of earnings of the Pressed Steel Car Company for the year ended December 31, 1903, with comparisons with the previous two years:

	1903.	1902.	1901.
Net earnings	$2,768,898	$4,578,114	$1,984,062
Depreciation	260,000	300,000	199,793
Balance	$2,508,898	$4,278,114	$1,784,269
Preferred dividend	875,000	875,000	875,000
Balance	$1,633,898	$3,403,114	$909,269
Common dividend	625,000	500,000	500,000
Surplus	$1,008,898	$2,903,114	$409,269

The statement affords ample explanation of the action of the directors in not renewing for another year the extra dividend on the common stock. The net earnings for 1903 show a decrease from those of 1902 of $1,809,216, and the surplus, after dividends, was $1,894,216 smaller than in 1902. The annual meeting of the stockholders will be held on February 17 to elect three directors for the term of three years, to succeed the three directors whose terms of office will expire on that date.

It is denied that the Crucible Steel Company of America of Pittsburgh are considering a proposition to issue $6,000,000 to $10,000,000 in bonds.

The annual meeting of the stockholders of the Standard Sanitary Mfg. Company of Pittsburgh was held in that city last week. The report for the year showed that the company earned over $300,000 after depreciation deductions. There was paid out $133,385 in dividends and $170,000 was added to the surplus, making this item $700,000. The following directors were elected: Theodore Ahrens, Francis J. Torrance, Henry Cribben, W. A. Myler, E. L. Dawes, W. K. McLaren, James C. Kline, C. F. Arrott, William Arrott, A. J. Volrath, Oscar Marcheutz and D. Jameson. Mr. Ahrens was chosen president; Mr. Torrence, first vice-president; Mr. Cribben, second vice-president; Mr. Myler, secretary and treasurer, and Mr. Dawes, general manager. The regular quarterly dividend of 1¾ per cent. was declared.

Dividends.—Pressed Steel Car Company have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable February 23, and a quarterly dividend of 1 per cent. on the common stock, payable February 29.

Wheeling Steel & Iron Company have declared the regular quarterly dividend of 2 per cent.

New York.

NEW YORK, February 3, 1904.

Pig Iron.—Locally, only a moderate amount of business has been done in Foundry Irons, and the market continues easy. In some of the territory adjacent to this city there is some scarcity of spot Iron, owing to delays in deliveries, notably of Southern Iron. This inquiry for prompt delivery is noted also in Basic Pig, for which the demand has been increasing. We continue to quote Northern Foundry No. 1, $15 to $16; No. 2 Foundry, $14.50 to $15; No. 2 Plain, $13.75 to $14, and Gray Forge, $13.25 to $13.75, tidewater. Tennessee and Alabama brands are quoted: $13.25 to $13.75 for No. 2 Foundry and $12.50 to $13 for No. 3 Foundry. Ferromanganese is selling at $42 to $43, delivered.

Steel Rails.—Very little has been done in Standard Rails, aside from the sale of 40,000 tons to the Canadian Pacific Railroad at $21.25, delivered, Montreal. We continue to quote Standard Rails $28, at mill, and Light Rails $25 to $27, according to section.

Cast Iron Pipe.—Although at the moment there are no public lettings in this locality involving any considerable tonnage, the inquiries being received from municipalities and private companies continue large, and are very promising as to future business. These inquiries are still much in excess of anything before known at this season. Carload lots are quoted at $28 per gross ton for 6 to 10 inch, and $27 for 12-inch upward, at tidewater, with special prices on large quantities, depending upon the desirability of the order.

Finished Iron and Steel.—The past week has been decidedly quiet in the Structural line. The business booked by the leading interest in the month of January proved to have been about two-thirds that of an ordinary month. This indicates a considerable falling off, but not so serious as had been anticipated. Conditions in the Structural trade are now quite trying to manufacturers who are not well fortified financially. Several failures in the building and bridge line have occurred since the year opened. Competition is too keen for those who are not closely connected with sources of supply of raw material. A considerable tonnage is in sight, both in bridges and buildings, which will be closed some time this month. The extreme severity of the winter has possibly had something to do with the dullness in this branch of trade. Conditions have certainly been very unpropitious for any kind of outside work. It is therefore naturally expected that with the opening of spring a great deal of accumulated business will come on the market. While the Plate trade for the past week has been light, good inquiries are in hand, particularly from the ship and boat building yards, and quite a tonnage of Plates will shortly be placed for new vessels. Prices are firmly held, except on very light Plates, rolled by both standard Plate mills and some Sheet mills. The Bar trade shows rather less activity, but Bar Iron manufacturers state that they are still having considerable business offered, which could be booked if they chose to accept the extreme prices current early in January. We quote at tidewater as follows: Beams, Channels, Angles and Zees, 1.74½c. to 2c.; Tees, 1.79½c. to 2c.; Bulb Angles and Deck Beams, 1.84½c. to 2.05c. Sheared Plates in carload lots are 1.74½c. to 1.85c. for Tank, 1.84½c. to 2c. for Flange, 1.94½c. to 2.10c. for Marine, and 1.94½c. to 2.50c. for Fire Box, according to specification. Common Bar Iron, 1.30c. to 1.40c.; Refined Bars, 1.45c. to 1.50c., according to quality; Soft Steel Bars, 1.44½c. to 1.50c.

Old Material.—The market is very dull, transactions being limited to small quantities. Buyers are only taking sufficient to cover their immediate necessities, and these requirements appear to be very light. Steel Scrap, which was for some time in much better demand, has relapsed into its former dullness and prices are lower. Approximate prices per gross ton, New York and vicinity, are as follows:

Old Iron Rails	$15.50 to $16.00
Old Steel Rails, long lengths	11.75 to 12.00
Old Steel Rails, short pieces	10.00 to 10.50
Relaying Rails, heavy sections	.... to 18.00
Old Car Wheels	12.50 to 13.00
Old Iron Car Axles	17.00 to 17.50
Old Steel Car Axles	14.00 to 15.00
Heavy Melting Steel Scrap	10.00 to 10.50
No. 1 Railroad Wrought Iron	12.50 to 13.00
Iron Track Scrap	12.00 to 12.50
Wrought Pipe	9.25 to 10.00
Ordinary Light Iron	7.00 to 7.50
Cast Borings	5.00 to 5.50
Wrought Turnings	7.50 to 8.00
No. 1 Machinery Cast	12.00 to 12.50
Stove Plate	9.50 to 10.50

The United States Steel Corporation has just started Columbus furnace No. 1, Lorain No. 2 and Neville Island furnace.

Metal Market.

NEW YORK, February 3, 1904.

Pig Tin.—A sharp decline in prices followed the announcement of the monthly statistics on Monday last. The statistics for the month of January showed up very unfavorably, and this fact, coupled with the natural weakness of the article due to lack of demand on the part of consuming interests, proved entirely too much for the bull element to withstand. Prices here broke 1c., and in London the quotations declined almost £2. At the close to-day spot to February were quoted here at 27½c. to 28c. London cabled £126 2s. 6d. for spot and £126 for futures to-day. The January statistics showed that the American deliveries into consumption decreased 1000 tons, as compared with the corresponding period of last year. This equals a decrease in consumption of about 30 per cent. The trade here were not especially surprised at this showing, as they have known that the conditions must be something as they were shown to be, judging from the lack of demand for many weeks past.

Copper.—Further reductions in prices were made, and the weakness which has characterized the market for some time has been emphasized. The "official" quotations on 'Change have been marked down ¼c., but even the figure thus established was held in the trade to be ⅛c. above the actual price. The present figures posted by the New York Metal Exchange are as follows: Lake, 12.37½c. to 12.62½c.; Electrolytic, 12.25c. to 12.50c.; Casting, 12.12½c. to 12.37½c. The London cables came as follows: Spot, £56 5s.; futures, £55 17s. 6d.; Best Selected, £59 10s. The latter quotation is £1 5s. below that quoted for the same grade a week ago. The exports for the month of January agregated 28,808 tons, being the largest on record. Sellers are still numerous and purchasers scarce.

Pig Lead.—Since our last writing, the American Smelting & Refining Company made another reduction in prices. They cut spot Desilverized to 4.40c. for 50-ton lots. Spot in store here is to be had at from 4.45c. to 4.50c. St. Louis quotes 4.30c., and London has declined to £11 2s. 6d.

Spelter.—The market is very dull, with prices considerably easier. Spot is quoted here 4.90c. to 5c. St. Louis telegraphs 4.65c., and London has advanced a shade to £21 15s.

Antimony.—The market is quiet and unchanged. Cookson's is quoted 7.50c. to 8c.; Hallett's, 6.75c. to 7c., and other brands command 5.75c. to 6.25c.

Nickel.—No change is noted in this market, 40c. to 45c. being quoted for large lots, and 50c. to 60c. for smaller quantities.

Quicksilver.—The market is quiet, but steady. Flasks of 76½ lbs. are quoted at $47.50. London is quoted at £8 5s.

Tin Plates.—There is no change to be noted. Quotations are made on a basis of $3.45 per box of 14 x 20 100-lb. cokes, f.o.b. mill, equivalent to $3.64, New York. There is no change in the Swansea market, the quotation being 11 shillings 3 pence.

Trade Publications.

A. Mugford, engraver and electrotyper, of Hartford, Conn., has issued an attractive pamphlet, whose pages are devoted principally to the making of curved plates for use on Harris or other rapid presses printing from a curved or cylindrical bed. Mr. Mugford has made a specialty of the preparation of these plates and has a plant equipped with the necessary special machinery for the purpose. The pamphlet is illustrated to show the several processes in the manufacture of a curved plate.

The Lombard Company, 236 A street, Boston, Mass., issue printed matter describing, among other products, hand finished grindstones, of which they make a specialty. The manufacturers state that these stones, being cut by hand, they are able to absolutely guarantee them free from hard and soft places and to be of uniform grit. Hand finished stones are particularly adapted to the grinding of lathe tools, knives and machine tools wherever a soft, sharp, cutting grit is required. They state that they carry in stock a full supply of stones of all sizes.

John Bozt, who was formerly connected with the Dominion Iron & Steel Company of Sydney, Cape Breton, is now assistant superintendent of the blast furnace department of the Maryland Steel Company of Sparrows Point, Md.

The new converter and the mixer at the Ensley steel works of the Tennessee Coal, Iron & Railroad Company will be started in the middle of the month.

Bessemer Plant of Republic Iron & Steel Company.

In a recent issue of *Industries*, published at Youngstown, Ohio, appeared an account of recent improvements and extensions made at the Bessemer plant of the Republic Iron & Steel Company, as follows:

Chief among the improvements made in the steel producing capacity of the Valleys during the past year was the practical rebuilding of the Bessemer steel works of the Republic Iron & Steel Company, the output of which was doubled. The last semiannual statement of the company credits these works with an annual capacity of 400,000 tons, and there is no doubt that this figure is within easy reach. The equpiment consists of the necessary cupolas, five in number, which were recently enlarged, for melting the pig iron which is furnished by the company's own blast furnaces and such iron as they may buy from outside parties. The work of enlarging these cupolas was done by the Wm. B. Pollock Company and the Enterprise Boiler Company.

The two converters are of 10 tons capacity. The engine for blowing the steel was furnished by the Allis-Chalmers Company, of the vertical steeple type and 3000 horse-power. The ingots are stripped from the molds by Aiken strippers, from which they are transferred to soaking pits of the usual type used at steel works for this purpose. For reducing the ingots to billets a pair of Wm. Tod reversing engines are used. These engines have 54 x 66 inch cylinders, and have a horsepower of approximately 6000. They drive a 40-inch blooming mill, which was designed by Willis McKee, chief engineer, and is used to supply blooms to the 26-inch mill, which comes next in line, or for rolling slabs, which are sheared and shipped from the blooming mill proper.

The 26-inch mill is a two high semicontinuous mill with three pairs of rolls, and will reduce a 7½ x 6½ bloom to a 4-inch billet in five passes and to a 3-inch billet in seven passes. Four-inch and 3-inch billets are sheared and shipped to the other mills or the entire piece is transferred to the 18-inch mill, depending upon the size desired. The 26-inch mill is driven by a tandem compound engine built by the Wm. Tod Company, with an accredited horse-power of 5000, and the 18-inch mill is attached to a 5000 horse-power Filer & Stowell engine.

These mills are inclosed in one building, and the engineering work in connection with them was done by S. V. Huber, engineer, Pittsburgh. The mills proper were built by the Lloyd Booth department of the United Engineering & Foundry Company, and most of the tables and other parts were made by the Youngstown Foundry & Machine Company. Great credit is due both of these concerns for the excellence of their work. The power for operating the tables and the other auxiliary machinery is furnished by a separate power plant. The installation of this department consists of two generators, one of 50 kw. capacity and the other of 300 kw., which are driven by tandem compound Buckeye engines. The steam is generated throughout this plant by Stirling boilers.

Bids have been asked by the Department of Public Works, Philadelphia, for more than $2,000,000 worth of work on new filtration plants. The bids will be opened on February 18 and are in anticipation of the approval by the voters of the $16,000,000 loan. The principal item on the specifications is for a low-pressure pumping station at Lardner's Point. The rest of the proposals are for cast iron water pipes to connect the Queen Lane branch with the Torresdale filters, for electrical generation and a main switchboard for Pumping Station No. 2 at Lardner's Point, and a pumping station engine and boiler for the same station.

Profit taking and raiding after an enormous advance caused an extraordinary decline in cotton on Tuesday, the greatest in a single day within the memory of the present generation, a fall which, at its maximum, reached 136 points. July cotton in New York had reached 17.42 cents, and in New Orleans, 18 cents.

The Chicago Machinery Market.

CHICAGO, January 30, 1904.

A better feeling pervades the machinery and tool market. With few exceptions producers report business very much more active in January than during November and December, and state that inquiries for their lines are liberal and encouraging. During the dull period in the last quarter of 1903 the dearth of domestic business led manufacturers to seek for a foreign market, and this effort is bearing fruit in the shape of increased foreign business in many lines, notably in wind mills. In some instances labor costs have been materially reduced, but as a rule the saving in manufacturing cost is more apparent in materials than in labor. The large number of skilled mechanics who have been thrown out of employment by the dull season through which we have just passed is taken by manufacturers as a guarantee against serious labor troubles this coming spring.

Special Machinery.

The Allis-Chalmers Company, Chicago, report business exceptionally active in saw mill machinery, good in flour milling machinery and rather quiet in mining and cement machinery and equipment. However, the volume of inquiries on mining machinery for the last few weeks has been very great, and a large business is looked for in months to come.

The Bignall & Keller Mfg. Company, Edwardsville, Ill., builders of pipe threading machinery, say the general feeling in business has quickened somewhat since the first of the year. Inquiries are strong, but buyers do not seem to be more than supplying their immediate needs, although there are some prospective buyers. The company occasionally fill orders for England and Canada, but the larger proportion of their trade is domestic. The most prominent orders received during the month were for three machines from the Pacific Coast, including one 12-inch. They still maintain their wage scale and expect to continue in this way, with no difficulty with labor.

The D. Clint Prescott Company, Menominee, Mich., report that in their mining department business is rather quiet, but to offset this they have more business in their saw mill machinery department than ever before. They find a better feeling and quicker demand than two or three months ago. The first of this year the company began making some reductions in labor cost.

The Stover Mfg. Company, Freeport, Ill., manufacturers of hardware specialties and windmills, are having a very busy month, as the orders taken for 1903 for January shipment are keeping them very busy. There has been some reduction in price on their line of hardware, not on account of reduction in cost of labor so much as on account of material. This reduction, no doubt, has stimulated the trade, although general conditions are quite favorable for an active business in their lines. The company are having quite an increase in foreign business on the windmill line, and the trade in hardware is growing also, but not in such proportions as the other lines. Altogether business for January this year is better than it was a year ago, and indications are favorable for an active trade in this line during the entire year.

The Holthoff Machinery Company, Cudahy, Wis., are finding an improvement in the demand for machinery in their line, particularly mining, milling and smelting machinery, gas producers and gas engines; so much of an improvement has there been in trade that the company have decided to increase the capacity of their plant by the expenditure of over $500,000, making an investment of something over $1,000,000. They have more orders in hand than they can well fill with present facilities, and have every reason to believe that the business is going to continue. While there has been a disposition seemingly to hold back in the way of improvements in the building of milling plants, there is now a great deal of activity in that line, and apparently no feeling of uncertainty as to the future. The cost of labor in the company's shops remains practically the same as last year, and there seems to be no reason to believe that there will be any serious difficulty with labor in the near future. The company are doing considerable business in Mexico and have inquiries from South America, as well as from Australia. They have not been in shape to handle much of this business as yet, but expect to increase the sales of their product in its entirety, particularly in Mexico. They have recently closed contracts with the Amparo Mining Company for Mexico, covering a full line of machinery for reduction plant, including Crossley gas engines and Loomis-Pettibone gas producers, besides a great many other smaller contracts for miscellaneous machinery. This company recently consolidated interests with the Loomis-Pettibone Gas Machinery Company of New York City under the name of the Power & Mining Machinery Company, under which name business will be conducted as soon as the papers are made out. The Power & Mining Machinery Company have, within the last 30 days, closed contracts for new gas power plants on the Loomis gas producer system with American Crossley gas engines, which the Holthoff interests will build, for about $300,000, and several large plants are in view, contracts for which are expected to be taken within the next 30 days.

Power Transmission Machinery.

Stephens-Adamson Mfg. Company, Aurora, Ill., report an increased demand in elevating and conveying machinery over that experienced in October, November and December. There is also a fair demand for power transmission machinery, such as shafting, pulleys, &c., and they look for increased business in this line in the next two or three months. Buyers seem to be purchasing mostly for their immediate needs; but that is natural, as there is comparatively little of this material that is carried in stock, either by dealers or consumers. No reduction in wages has been made and no labor troubles are looked for this spring. The labor situation in the Fox River Valley at present is satisfactory.

The Ætna Foundry & Machine Company, Springfield, Ill., do not see that buyers are more than supplying their immediate needs, as the demand for their line is not as brisk as it was a few months back. The company have not made any important sales so far this year, but have enough old orders to run their plant for some months. No trouble with labor is looked for during the coming months, as many men are out of employment.

Tools and Supplies.

Charles H. Besly & Co., Chicago, find that the past month was as good as January of last year, and trade for 1904 is opening up better than was expected. They have shipped grinders to Pennsylvania, Michigan, Ohio, New York; also to Europe and Australia. They are having a good demand for their other products. Their foreign trade with Europe is increasing, particularly in the sale of grinders. Several shipments have been made of taps and die stocks to South America.

The Scully Steel & Iron Company, Chicago, say that since the beginning of the year business has improved materially and orders are coming in quite freely. Apparently stocks throughout the West have been quite exhausted, for every order received represents a rush, in many instances a part of the material being taken from warehouse, which is a clear indication of the scarcity of material on hand. The general feeling seems to be that prices are not going any lower, and buyers are contracting freely for future delivery. Labor costs have not been reduced materially, either in their own business or in the general trade. The high cost of doing business in the face of close competition has some effect on the profits of business, but they are in hopes that the increase of business will more than offset any increase in cost. Foreign inquiry is increasing, particularly on plates, pipe and structural material, more, perhaps, from Canada, British Columbia, South America and Mexico. January business will show a considerable increase over December, with every indication that February will be still better.

The Ransom Mfg. Company, Oshkosh, Wis., makers of grinding and polishing machinery, state that they have noticed a slight improvement during the last two or three weeks, the demand being principally for belt driven grinders. Trade is still slow on the more expensive tools. Buying seems to be for immediate needs only.

The Gardner Governor Company, Quincy, Ill., builders of air compressors, engines and tools, cannot as yet detect any better feeling as indicated by an increased demand for goods, and do not think that buyers are doing more than supplying what they absolutely must have. They do not anticipate any trouble with labor this spring.

The B. F. Barnes Company, Rockford, Ill., state that business during January was considerably better than during December. They have a good demand for gang drills, as well as other tools, but believe that buyers are not stocking up very heavily and are simply purchasing for their immediate needs. They have made no reductions in the price of labor, and do not anticipate any difficulty on this question in the immediate future. Foreign business during the past month has been a little quiet, but the prospects are favorable for a good future trade, both foreign and domestic.

The Hill Tool Company, Anderson, Ind., find business picking up considerably. Judging from the orders that are being placed, their dealers seem to be buying mostly for immediate needs, although in some cases they are ordering for stock. They are receiving a very nice foreign business. The cost of labor is about the same in their plant, and no trouble is expected from that quarter this season.

Williams, White & Co., Moline, Ill., say that they notice an improvement and better feeling in the market during the last two weeks. They do not think, however, that buyers are buying more than their actual needs call for. The same wages as formerly are being paid and no difficulty with labor is anticipated. December business was very poor, the poorest they have had for the last five years.

Engines, Boilers and Pumps.

The S. Freeman & Sons Mfg. Company, Racine, Wis., makers of boilers, windmills and implements, report a better demand for their line. They have entered a good many boiler orders since the first of the year, more than in two months before, and there is more inquiry at the present time than they have seen in a good many months. Buyers, however, are buying only what they require. Their foreign trade is increasing somewhat in the agricultural implement line, especially in windmills, good orders having recently come from the Argentine Republic and France.

The Nordberg Mfg. Company, Milwaukee, Wis., engine builders, report an improved demand, particularly from copper mining companies and street railway companies, though in the matter of small engines the interests are diversified. Labor cost has not been reduced by cutting of wages, the rate of wages remaining the same. No difficulty with labor is anticipated this spring.

The American Steam Pump Company, Battle Creek, Mich., say that they are very much pleased with the present month's business and the outlook for the future. They have not reduced wages and do not anticipate any difficulty with labor. Their foreign trade is increasing, and they look for the present year to average as well as the past.

The Otto Gas Engine Works, Chicago, say that prospects for the present year are very good. The business for January so far is larger than the corresponding month of last year, and from inquiries being received they anticipate a large amount of work being done for the next six months.

The Filer & Stowell Company, Milwaukee, Wis., engine builders, are still running full force night and day and have not laid off a man. No reduction in wages has been made by the company, and no trouble is expected with labor, as men are plentiful.

Philadelphia Machinery Market.

PHILADELPHIA, February 1, 1904.

While there has been an improvement in conditions in some lines in the Philadelphia machinery market during the past month, there has not been enough new business in general to warrant an expression of opinion that conditions have materially improved. That there is a change for the better in some cases is gratifying, but whether this will continue during the next few months cannot be estimated at this time. The preponderance of opinion is not very sanguine. In most of the machinery lines the business anticipated last month did not develop, and while a resumption of trade cannot be measured by the standing of January, 1903, we may say that it was a trifle better than December. At the same time a number of the plants have less work on their books than they had during that month, they having pretty well caught up on their back orders, and as new business of any size has been scarce, the plants governed by such conditions have less to do now than during the latter months of 1903. This phase of affairs is evident in the larger plants, while the smaller ones receiving orders for several machines, on which operations can be started almost at once, are consequently more active. Manufacturing plants are in most all cases being operated either on shorter hours or with a decreased working force. Curtailment of expenses continues and efforts to keep all the plants in constant operation are being strenuously made. Inquiries are numerous, but do not as a rule develop into business promptly. Buyers are very much inclined to "shop around" extensively before placing an order, and in many cases there are additional inquiries about price, &c. Efforts to get the best machine or tool adaptable to the purchaser's requirement, and that at the very lowest price, are strongly in evidence. One inquiry thus going around the circuit of manufacturers and dealers sometimes creates an impression of extensive demand, which is more or less misleading. Large specifications are notable in their absence, only one of any size being in the market for machine tools. The general trend of inquiries is rather for single machines or a few tools to complete an equipment or replace worn out tools.

Some latent inquiries held over from last year developed into business after the middle of the month, as was expected. Another feature of inquiries in some lines, we are advised, is the tendency of the buyer to go direct to the manufacturer with his inquiry, rather than through the middleman, as was customary heretofore, the idea being no doubt that concessions might be obtained in price.

Deliveries on almost all lines of tools can be made promptly; but few plants have sufficient work on hand to delay deliveries beyond the customary time, except in cases where special tools are ordered, and manufacturers even then are generally able to begin work on these at a very early date. Stocks of medium and light standard tools, and even some lines of heavy tools, have increased, and are larger than most tool builders care to carry.

The various iron and steel foundries have experienced a falling off in demand for castings; in fact, to such an extent in some instances that the plants have been running irregularly. With the lighter demand for machinery and tools this is to be expected and will probably continue until general conditions become brighter. While most of the foundries are anxious for work, but little concession is being made in the price of castings. Notwithstanding that raw material is cheaper than it was some months ago, the labor question in the foundry is anything but satisfactory, and it is said that at the prices paid for labor there is not much room for further reduction in the price of castings under ruling conditions. Under these circumstances, therefore, it is quite possible to obtain very prompt deliveries for almost all classes of work.

Export trade is weak, there being practically no demand for machinery or tools. Manufacturers who have had a regular foreign trade report a falling off in their line. Trade conditions abroad have not improved to any extent, and our present prices are by no means attractive to the foreign buyer, and manufacturers do not appear inclined to push this trade on a money losing basis.

The various shipyards show signs of more activity. The recent contracts obtained by the Wm. Cramp Ship & Engine Building Company for the erection of battle ships for the Government will keep that yard busy for some time. The other shipyards also have a fair amount of work on hand.

On the Bourse machinery floor dealers in machinery and tools have had a variable month; sales have been irregular and unsatisfactory. In a few lines some business developed during the latter part of the month, but the aggregate has been small.

The market for smaller engines, tools, boilers, &c., is quiet and reflects the condition of trade in the larger sizes. The demand for machine shop supplies is dull, with plants being operated at decreased capacity, the natural demand for this class of goods is weaker.

Prices are practically unchanged on standard tools. While concessions are constantly being asked for, it is said that manufacturers believe that business would not be increased to any marked degree at lower figures. The factors in favor of lower prices are strong, and in some instances concessions are said to have been made in order to close business.

The Schutte & Koerting Company, general machinists, have purchased property adjoining their present plant at Twelfth and Thompson streets and will erect an addition thereon, beginning operations, it is said, about March 1. The new purchase measures 16 x 52 feet, and the shop to be erected will, it is estimated, cost about $12,000.

City permits have been taken out for an addition to the plant of John M. Melloy & Sons; a four-story brick building, 38 x 108 feet, will be erected on Brandywine street, west of Broad street, for light manufacturing purposes at an estimated cost of $13,000. Operations will be started, it is said, as soon as the weather permits.

The Girard Machine Works, formerly of Twenty-sixth street and Girard avenue, but lately at Twentieth and Washington avenue, will remove their plant in the early spring to Minersville, Pa., where a new building 100 x 100 feet and three stories high is being erected for them. Besides the erection and equipment of brewery plants, which has been their specialty, they will engage in the manufacture of general machinery and equipment for mining purposes. The new plant will have a complete equipment of tools necessary for this class of work. A brass foundry will be added and in the near future they contemplate the addition of a complete iron foundry.

The Pressed Steel Mfg. Company, manufacturers of the Knipe ball bearings, removed their offices from Ridge avenue and Noble street, where they have been located for some time, to 545 Philadelphia Bourse, where all the business of the company will be transacted.

Merritt & Co., manufacturers of expanded metal partitions, lockers, &c., have just closed a contract for the complete partition, locker and stock room shelving equipment for the new Horn Building, Pittsburgh, Pa. The shelving

is to be of expanded metal. These parties report a good inquiry for their lines, with fair resultant orders.

The Falkenau-Sinclair Company have had a very gratifying increase in business during January. Inquiries have been good and a number of satisfactory orders have been booked, the demand for presses being particularly active. While the business has not been for a large number of tools from any one concern, they have had no difficulty, they say, in closing orders of moderate size. Several large tools and a number of standard presses have been shipped during the month, as has also an 800,000-pound testing machine for the Boston Navy Yard, for the United States Government.

The I. H. Johnson, Jr., Company, Incorporated, have had a fair month; some good orders have been taken, but there is room for considerable improvement. Orders have been booked for 36 and 48 inch lathes with long beds and for a number of smaller tools. Some shipments during the past month include a 36-inch lathe with a long bed, for the Steel & Condict Works, Jersey City, N. J.; a 36-inch electrically driven, with a 19-foot bed, has been delivered to the Lorain Steel Company, Lorain, Ohio, and a 54-inch lathe with a 29-foot bed has been shipped to the Meihlé Printing Press Company, Chicago, Ill. There has also been a number of smaller tools shipped to both local and out of town parties.

Dienelt & Eisenhardt note an improvement in the demand for machinery and tools and a corresponding decline for castings. Orders have been taken for additional oil cloth printing machines, hydraulic presses and for special tools. Some new tools have been installed to facilitate special work, and most of the machinery is being changed from belt to electric driven, a complete electric plant, engine, generator, &c., having been installed to furnish the power. Sufficient orders are now on hand to keep the machine department busy for some months to come. A fair demand is also noted for hydraulic jacks and dead stroke hammers.

The Link-Belt Engineering Company are fairly busy. There has been a good volume of inquiries, but orders are slow, particularly on bids of any size. An order has been received from the Western Maryland Tide Water Railroad for the erection at their Baltimore, Md., terminal of a numbr of coal loading chutes of the Link-Belt adjustable type. These chutes permit of a variable loading hight to conform with the size of vessel being loaded. The International Portland Cement Company, Ottawa, Canada, have also placed an order with them for an extensive coal handling system, to have a capacity of 42 tons per hour. Deliveries during the past month have been as usual and cover shipments to many Eastern points.

Alfred Box & Co. report a fair volume of new business coming in and sufficient work to keep the plant running full for several months is on their books. Among some recent orders was one for a 15-ton hand power traveling crane for the Yonkers, N. Y., power station of the Interurban Street Railway Company. Two electric hoisting machines have been ordered by the Volney G. Bennett Company, Camden, N. J., for handling heavy timber. A 5-ton electric jib and a 5-ton hand power jib crane have been ordered by Williamson Bros. Company for their new foundry in this city; these latter make a total of five Box cranes of this type that they have recently ordered. Recent shipments made by the Box Company include a 40-ton four-moter electric crane for steam engine building No. 42, at the Boston Navy Yard, for the United States Government; a 15-ton electric traveling crane for the Chelton Avenue Station of the Philadelphia Rapid Transit Company, and a 5-ton hand power traveling crane for the Burlington, N. J., plant of the United States Cast Iron Pipe & Foundry Company.

The Energy Elevator Company have recently installed at Keith's Chestnut Street Theater, in this city, new system for the opening and closing of stage ventilators, which in no way interferes with the automatic fire devices attached to the ventilators. The Energy device enables the operator to instantly open or close the ventilators at will and in case of fire it is not necessary to wait until the fusible links are melted, but the ventilators can be instantly opened and an upward current of air produced. The asbestos curtain hoist which the Energy Company installed at the above theater some time ago met with the full approbation of the recent Theater Commission appointed by the Mayor of Philadelphia, and this style of hoist for theater curtains has been specified in the commission's improvement for safeguarding the theaters from fire. General business, the Energy Company advise us, has been very good during January. Orders for a large number of elevators have been received and shipments made to out of town as well as local parties.

The Baldwin Locomotive Works continue busy, although not as active as during the early part of last year. Sufficient work is on hand to keep the plant in continuous operation, but new orders come in slowly. During the past month one order for 30 engines was received from the Delaware, Lackawanna & Western Railroad; this was divided between consolidation, mogul and passenger type locomotives. An order for 12 locomotives for the Seoul-Fusan Railway was also received. Most of the orders, however, have been from individual concerns, rather than from the railroads, and for the lighter types of engines. Recent shipments include eight engines exported to the Seoul-Fusan Railway, and deliveries on orders to the Philadelphia & Reading, Chicago & Northwestern; Pennsylvania; Baltimore & Ohio; Chicago, Milwaukee & St. Paul Railway, and to a number of individual concerns.

PERSONAL.

H. P. Young, for years purchasing agent for Allis-Chalmers Company, Chicago, has opened offices at 209 Great Northern Building, Chicago, where he acts in the capacity of purchasing agent for mines, small railroad companies and users of machinery and tools.

W. P. Putnam, formerly chemist for the Michigan Malleable Iron Works, Detroit, Mich., has severed his connection with that company and opened what is known as the Detroit Testing Laboratory in the Union Trust Building, Detroit.

A. N. Spencer has associated himself with the American Steel Foundries as sales agent, having charge of the sales office in the Pittsburgh district.

James Gayley, first vice-president of the United States Steel Corporation, is to be elected president of the American Institute of Mining Engineers for the year. Julian Kennedy of Pittsburgh, C. D. Walcott of Washington, and G. W. Maynard are up as vice-presidents, while F. L. Grammer of Baltimore, Charles H. Snow of New York, and Joseph Hartshorne of Pottstown are nominated as managers.

Henry S. Northrup of New York, for many years identified with the manufacture of stamped steel ceilings, has sailed for Europe. He will introduce American methods in England and Germany.

J. F. Vogel has been elected president of the Gendron Wheel Company of Toledo, Ohio, to succeed John Showell, deceased.

W. L. Andrews, coal and coke agent of the Baltimore & Ohio Railroad at Pittsburgh, has resigned to become traffic manager of the Consolidated Coal Company, with headquarters at Baltimore.

On Saturday evening, January 30, the officials of the H. C. Frick Coke Company tendered a banquet to O. W. Kennedy, who recently resigned as general superintendent, and which was held at Scottdale, Pa. Mr. Kennedy was presented with a chest of silver and a Swiss hall clock. Toasts were responded to as follows: "H. C. Frick Coke Company," by Secretary O. H. Cole; "Picks and Shovels," Division Superintendent Edward O'Toole; "The Cash Box," Treasurer Phillip Keller; "The Siamese Twins," James W. Anawalt; "The Official Organ," H. P. Snyder, editor of the *Connellsville Courier;* "The Lieutenants," W. H. Hugus, superintendent of the Davidson mines. Assistant Superintendent W. H. Clingerman responded to "O. W. Kennedy." It was during the response to this toast that the silver chest and clock were presented to Mr. Kennedy. In addition to the presents named, Mr. Kennedy will be given a beautifully engraved testimonial signed by all general officers of the company, heads of departments, superintendents, mine and yard foremen and pay roll clerks. In all, the testimonial will contain about 240 signatures.

A. Barbey of Boston, Mass., has been appointed New England agent of the Lackawanna Steel Company.

Arthur C. Scott, for a number of years with the Draper Machine Tool Company of Worcester, Mass., has entered the employ of the Norton Emery Wheel Company of Worcester, to represent the company in Connecticut and New York State.

J. Walter Rhodes, president of the Cherry Valley Iron Company, Pittsburgh, sailed for Europe on Tuesday, February 2, and will be gone about three months. Mr. Rhodes expected to spend the winter at Hampton Terrace, Ga., but owing to ill health, and on the advice of his physician, he will go to Europe.

Henry Phipps has been elected a director of the United States Steel Corporation.

HARDWARE.

MANY Hardwaremen are so situated that they will find Furnaces a good line to add to their regular business. The man who sells Furnaces should, of course, contract to put them up. This was at one time a difficult task, requiring an expert tinsmith, able to make the casing, stacks, pipes, boots, register boxes, &c. Thanks to modern methods, however, we now have manufacturers who make a specialty of all such Furnace Fittings, supplying them at cheaper rates than they can be turned out by hand, and usually better finished, better proportioned and more accurately made. At one time, also, the installation of a Furnace in even an ordinary dwelling house seemed to require expert skill. To-day, the manufacturers of Furnaces have men in their employ who are prepared to instruct their customers how to set such heating apparatus, and will guarantee satisfactory results if their instructions are faithfully followed. These manufacturers are anxious to sell as many Furnaces as possible, and they take great pains to simplify their instructions and remove from the path of the beginner the difficulties likely to beset him. The scientific installation of a Furnace to secure the greatest efficiency in operation with economy in the consumption of fuel is still a problem for experts, requiring a long course of study and much experience. Nevertheless, it is possible for any man of fair intelligence to grasp easily the principles of Furnace heating, and with the assistance of the furnaceman to install Furnaces which will work satisfactorily and not be so extravagant in fuel consumption as to make a householder regret his investment. A handy man with some mechanical ideas, thus instructed, can take the ready made Furnace Fittings and connect them with little difficulty. The Hardwareman in a rural district will probably find many of his farmer customers very willing to enjoy the comfort of a thoroughly heated house when they learn how cheaply such a heating apparatus can be installed. Farmers in these days are just as anxious to make themselves and their families comfortable as those who dwell in cities.

This naturally suggests another line which can be taken up advantageously in towns not large enough to maintain a public water works system and regular plumbing shops. A Hardwareman in such a locality will often find opportunities for plumbing work which will justify the employment of a man capable of undertaking rudimentary plumbing jobs. The more enterprising citizens in such small towns, and prosperous farmers in the vicinity, are usually quite willing to put in modern conveniences, if some local firm is prepared to undertake the work and save the great expense of bringing workmen from a distant city. The installation of Tanks in attics, to be filled by Hand Pumps or Wind Mills, enabling a water supply to be piped to kitchens and bathrooms, is becoming a feature of domestic economy in progressive rural districts. The Hardwareman is preeminently the man who should seize the opportunity to secure this class of work.

Condition of Trade.

From some parts of the Hardware field reports are gratifying, indicating an excellent business with the promise of a continued demand. There are sections, however, in which the severe weather which has prevailed has had a repressing effect upon trade, and the movement of goods, as well as the transaction of regular business, is somewhat interfered with. Manufacturers report an increase in the orders which are coming to them, but business is without the snap and volume which have characterized it in the times of special activity. Prices generally are without important change, and under the circumstances are held with remarkable firmness. The large business which is doing in Wire and Wire Nails is regarded as an excellent indication, manufacturers in these lines reporting orders which are very satisfactory, taxing their capacity and tending to accumulate on their hands. The formation of pools covering the Hatchet and Axe interests commands the attention of the trade and results in higher prices for these goods. In other lines, which are not thus artificially steadied or strengthened, there is in some cases a better feeling, while in others slightly lower prices are being developed. On the whole, however, the market remains without important fluctuations and with a fair movement of merchandise.

Chicago.

(*By Telegraph.*)

In spite of the fact that the ground hog saw his shadow dimly on Tuesday, Hardwaremen are looking forward to an early spring, as evidenced by the rapidly increasing and almost unprecedented demand for spring goods. Shovels, Garden Tools, Poultry Netting, Wire Cloth and other spring goods are firm in price and active in demand. Shelf Hardware is moving satisfactorily. Builders' Hardware is somewhat better in tone than it has been for several weeks, and even Sheets and Bars and heavy Iron and Steel, which have been looked upon as the sick members of the family, are convalescing nicely. Demand for Nuts, Bolts, Washers and Screws is said to be better than for two or three months.

St. Louis.

(*By Telegraph.*)

The movement in response to demand in the Hardware trade shows no slackening. In fact, the call is growing day by day for all general lines, especially for spring supplies. The sales forces are putting greater energy than ever in their efforts, and, backed by stronger arguments in the matter of prices and quicker delivery, new individual records of sales in the future are looked for. The trade are making a strong demand for Poultry Netting, ordering early on account of the probable shortage later. Better prices for this product work to the advantage of both the manufacturer and jobber. While the local demand for Builders' Hardware does not promise to be great, the amount of contemplated new building in the West and South makes the outlook favorable for a liberal demand for this class of Hardware supplies.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade for the past two weeks in wholesale circles has been fair in volume, although salesmen complain of excessively cold and stormy weather, the effect of which is distressingly inconvenient to them on the road. Since January 1 weather conditions have not been such as to induce early buying by the retail trade, excessively cold weather making long journeys, to reach towns where purchases are made, inconvenient, the heavy falls of snow making roads impassable, which has therefore retarded business with the retail trade. It is, however, reassuring to the retail trade to hear that the international trade for the year 1903 shows an excess over any previous year, and the export trade for the year 1903 also shows an increase of trade in excess of any previous year. This is interesting to the Hardware trade, from the fact that Wire Nails, Barbed Wire and Heavy Hardware are among the articles on which export trade has increased, and if continued it must eventually reduce stocks on hand by manufacturers and possibly cause delay in making shipments in the near future.

Everything looks bright for the present year as soon

as the weather conditions change somewhat and as soon as the roads throughout our State are in condition to travel. Collections throughout the State have been fair.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The market shows signs of healthy movement. There is a reasonable demand for all seasonable stock, and we do not believe any one who is prepared to take care of his trade has cause to complain. In fact, there is a great deal for the railroads to do hereabouts for some time ahead, owing to the long suspension of navigation in the Ohio River and tributaries. Of the cold weather there has been now two solid months, boats have been tied up to the shore and snuggled into harbors, and nothing is moving save great floes of ice, which fill the channel from shore to shore, said to be in some cases 25 feet thick. Heavy snows have fallen north and south of us, but we are still in the dry belt. There is a deficiency of 14 or 15 inches of rain since March last. When we come to make it up, as we are always promised shall be the case, we expect to be in the market for an extra large supply of life preservers.

Of course, cotton prices form the staple of conversation in the territory south of us. It would seem as though the old King were coming to his own with irresistible force. Sixteen cents looks very juicy compared to 6 or 7 cents of a few years ago. We predict that if seed can be had, there will be a tremendous acreage planted. Then if we can keep the boll weevil out and the bull weevil in, all will be happy in the land of cotton. It is a great basis of credit in all the Southern country.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Nothing of material interest has occurred since our last report. January is ordinarily one of the busiest months of the year with the Hardware jobbers, and it has been particularly a busy month this year. We do not know, in fact, of a jobber in this section, who hasn't all the business that he can conveniently handle, and we have never seen the time when orders covered a more general line of goods than those we are now receiving. Trade has been held in check for a few days in Alabama and Georgia, on account of the heaviest snow that has ever fallen in this section of country, but this will only retard business for a short time, as snow in the South stays only a sufficient length of time to wear out its welcome.

The wheat crop in Tennessee does not look as promising as we would like to see it. A man who sows wheat must do so in faith; he simply obeys the Scriptural injunction, "In the morning sow thy seed." The wheat crop has a rough and rugged road to travel, and is beset by many dangers. It is too early yet to tell just what the outcome will be, but we hope that the harvest of 1904 will prove to be an "evening" when the planter need not withhold his hand.

Rumors are flying thick and fast in regard to the consolidation of the iron interests at Birmingham. If the deals rumored should be consummated, it would have considerable bearing on the general situation in the iron market.

Collections are good, and, taking all together, the conditions are very satisfactory.

Baltimore.

CARLIN & FULTON.—At the present time we have but little of interest which we can report in the way of business. This whole country has been snow and ice bound for several weeks, making travel almost impossible throughout the rural sections, and consequently interfering with local trade very much. In other sections business has kept up to the normal, and especially in the South, where there has been a large demand for plantation supplies, and every preparation is being made for another cotton crop.

Prices seem generally well sustained by the manufacturers, and we understand that the Axe as well as the Hatchet industries are now under control of one organization. The Wire and Nail manufacturers should show a great improvement in their reports for this quarter over the last three months of 1903, as we understand that an immense tonnage has been booked for spring business. We think after the weather conditions improve there will be a great demand for goods from all sections.

Cleveland.

THE W. BINGHAM COMPANY.—The year 1904 starts out with a good volume of business, and salesmen are sending in good, well assorted orders for immediate shipment. Are surprised to see the large amount of Carpenters' Tools that are included in them, indicating that the dealers are having and expect a good trade during the spring months on this line of goods. There are large quantities of Nails, Fence Wire and Plain and Barbed Wire being placed for shipment in February. Also there is a large trade on Carriage and Machine Bolts and Coach Screws at the present time. Prices have been exceedingly low, and there will probably be some trouble in filling some orders promptly, as customers realized the low prices at which the jobbers here have offered them and have booked a large quantity for immediate shipment. Trade generally is quite satisfactory, and collections are very good.

San Francisco.

PACIFIC HARDWARE & STEEL COMPANY.—We are in the midst of our rainy season, which probably implies to the uninformed that rain is falling heavily every day. Unfortunately such is not the fact, as we have passed through a most unusually long dry spell. In some sections of California practically no rain has fallen since early spring, a year ago. We live here in an agricultural and mining section where abundant water is required for good crops and for the purpose of operating mining plants. Notwithstanding that the indications for rain are particularly bad at this time, our people are not disheartened, and the fact that the volume of business for January has exceeded that of previous years is, to our mind, a good indication of the general prosperity that is surrounding us.

It is true of us, as in every other section, that prices are not as strong as we should like to see them, but the volume of business is not only satisfactory for the present, but looks promising for the future. Collections, too, are better than is usual at this time of the year, which is, strictly speaking, between seasons.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—There is nothing startling to report as regards present business or prospect of immediate change, either for better or worse, in the Pacific Northwest. Trade is of fair, seasonable volume, considering we are not yet out from under January. Weather is all right and the winter, so far, has been in favor of growing crops. Should the spring be as favorable as the winter has been there should be a large acreage sown, with good prospects for the harvest.

The lumber situation shows no change for the better as yet. There are contracts for logs now out where the price is higher than the rough lumber is selling for, a condition not favoring the millmen or boding well for the future. Collections are not all that could be desired, as farm products are being held on account of unsatisfactory prices.

New Orleans.

A. BALDWIN & CO.—Business in the Southwest still continues to hold up its extraordinary volume, and from present indications we cannot but realize the fact that the South and Southwest are consuming very large quantities of goods. The conditions in the agricultural sections are extremely bright and favorable, and we look for a continuance of this remarkable business for some little time.

NOTES ON PRICES.

Wire Nails.—The demand has become so active that there are grave doubts expressed as to the ability of mills to make deliveries on contract orders promptly. While current orders have received prompt attention up to the present time, it is doubtful how long this condition will continue, because of the crowded condition of mill order books and the difficulty of procuring cars to

handle the freight. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95
Retailers, less than carload lots	2.05

New York.—The demand for small lots from store has improved during the early part of the present week, showing an increase over the two previous weeks. From territory tributary to this point quite a number of orders for car lots have been booked for future delivery. The market is firm in tone, at the following quotations: Single carloads, $2.05; small lots from store, $2.15.

Chicago, by Telegraph.—It seems that ideal conditions for maintaining prices are here; in other words, that the present price of Wire Nails is really low in terms of supply and demand. All Wire Nail mills seem to be filled up with orders some weeks or months ahead, and some difficulty is being experienced by both Wire and Nail mills in getting sufficient cars to handle their in and out freight. With the prospect of a shortage of Wire, prices remain unchanged, as follows: Carload lots to jobbers, $2.05 per 100 pounds, Chicago; less than carload lots, $2.15; car lots to retailers, $2.10, all f.o.b. Chicago.

Pittsburgh.—We note a very heavy demand for Wire Nails, and several of the leading mills advise us that the market is approaching the point where it is not a question of price, but of getting deliveries. In some cases, we are advised, slight premiums over regular prices have been paid for prompt deliveries. It looks very much as though there will be a shortage in supply, and higher prices on Wire Nails before this month is out are practically certain. We quote Wire Nails at $1.85 in carloads to jobbers, $1.90 in carloads to retailers and $2 in small lots to retailers, all f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, plus actual rate of freight to point of delivery.

Cut Nails.—The Cut Nail Association hold a meeting on February 4, to the results of which the trade are looking with interest. Demand is more active than for some time, as a result of contract orders being placed by jobbers. No trouble has yet been experienced by the mills in making prompt deliveries. Quotations on Steel and Iron Nails, in all quarters, are as follows: $1.70, base, in carloads, and $1.75 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms, 60 days, less 2 per cent. off in 10 days.

New York.—The local demand is for immediate requirements and is somewhat limited in volume. Quotations are as follows: Carloads on dock, $1.84½; less than carloads on deck, $1.92½; small lots from store, $2.

Chicago, by Telegraph.—The Cut Nail market is in perceptibly better condition and shows greater strength in the presence of an increased demand. Just at present the Cut Nail manufacturers can make rather better deliveries than Wire Nail producers. Jobbers buy Cut Nails at $1.86½, base, per 100 pounds in car lots, Chicago, with $1.91½ the base car lot price to retailers.

Pittsburgh.—We note a more active demand for Cut Nails, and the mills are entering a larger tonnage than for some time. There is more disposition on the part of jobbers to place contracts, this being done in the belief that if the volume of business continues to increase prices may be advanced. The market is very firm and the outlook for spring trade is regarded as excellent. We quote Iron and Steel Cut Nails at $1.70, base, in carloads, and $1.75 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms, 60 days, less 2 per cent. off in 10 days.

Barb Wire.—Active demand is becoming more pronounced, especially from the West. Orders are being received at mill in such volume that it is questioned whether the capacity will be equal to the requirements for prompt shipments. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago, by Telegraph.—February and March are usually the months in which the largest bookings of orders are made by Barbed Wire mills, and the present month is opening up in a way that leads producers to believe that the bookings will be extremely large. Some mills are already 60 to 90 days behind their orders. We quote as follows: Painted Barbed Wire, $2.35 per 100 pounds, f.o.b. cars, Chicago, to jobbers; Galvanized, 30 cents higher. Prices to retailers 5 cents per 100 pounds higher than to jobbers in car lots and 15 cents in less than car lots; Staples, $2.20, Chicago, for Plain, and $2.60 for Galvanized to jobbers, with 5 cents advance to retailers.

Pittsburgh.—There is a very heavy demand for Barb Wire, particularly from points west of the Mississippi River, and it is evident from the way orders are coming in that the mills will soon be taxed to their utmost to get out tonnage as fast as needed. The tone of the market is very firm. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Smooth Fence Wire.—An increase in demand is reported, covering the capacity of production for the next 30 days at least. Quotations are as follows, f.o.b. Pittsburgh; terms, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.85
Retailers, carloads	1.90
Less than carloads	2.00

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—There is no let up in the activity manifested in this line, and there is little doubt wire mills will be pushed to their utmost to supply the demand for the first half of the year, at least. On the base sizes, 6 to 9, the current price is $1.95 per 100 pounds in car lots to jobbers, f.o.b. Chicago; $2 per 100 pounds to retailers in car lots, and $2.05 in less than car lots. A heavy tonnage is being booked at these prices.

Pittsburgh.—Demand is quite heavy and is getting larger right along. Some of the mills report they are booked up full for the next month or two. We quote as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days. Plain Wire, $1.80, base, for Nos. 6 to 9, in carloads to jobbers, and $1.90 to $1.95 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14.

Axes.—For some time past the leading Axe manufacturers have been in conference with a view to forming an organization by which the Axe market could be controlled and put in a more satisfactory condition. For the past year they have been working together with a good degree of harmony, and the recent conferences have resulted in the formation of a combination in which practically all the Axe manufacturing interests are united. Agreements have been reached in regard to the quota of each manufacturer, and a great many details determined with a view to correcting the irregularities and abuses of the Axe market, as well as to obtain remunerative prices. This movement has been entered into by some of the manufacturers with more or less reluctance, as on general principles they are disposed to look with disfavor on combinations or pools as a corrective of the evils of competition. The Axe business, however, has for some time been so unsatisfactory that it has been difficult to obtain reasonable profits and it is said that some well managed concerns have frequently been obliged to market Axes at prices closely approximating cost. This has perhaps made it feasible to form the organization into which the manufacturers have just entered, which went into effect 1st inst. The arrangement consummated attempts to regulate the selling of Axes with considerable detail and promises to correct some abuses with which the trade are

familiar. It will, too, involve higher prices. Something, it is hoped, will be accomplished in the way of standardizing the quality of the goods, as the various grades are carefully defined and differentials in prices determined upon. It is to be hoped, too, that something will be done to correct the abuses connected with special brands, and the sale of such brands and their various qualities will be regulated with care and system. An important step has been taken in dividing the year into seasons, the first covering February and March; the second, April, May and June; the third, July, August and September, and the fourth, October, November and December. The prices determined upon at the present are available only for goods shipped during the first period, at the close of which it is possible that an advance may be made, though no definite assurance of this is given. In a similar way, after the 1st of April and prior to the 30th of June, no orders are to be accepted at prices then ruling, except for goods to be delivered during such period. This principle will apply also in the remaining seasons. It is hoped that this arrangement will tend to relieve manufacturers from the carrying of stocks for the jobbers to the extent to which this has heretofore been done. The grade is divided into three classes, the largest jobbing houses constituting one class and other jobbers constituting a second class, the retail trade constituting still another class. For these different divisions of the trade differentials of prices are determined upon. As an indication of the general range of prices established, it is of interest to know that the base price of regular first-quality Single Bit Axes to the retail trade is put at $6.50 per dozen, the Double Bit being $8.50 per dozen. An important departure from the former practice is in establishing a range of prices according to the weights of the Axes instead of selling all weights as heretofore at the same price. The warranting of Axes, too, is abolished. This arrangement has been accomplished so recently that the manufacturers have not yet sent out their printed matter, form of contracts, &c., or made definite announcement of their prices. It is conjectured, however, that the advance will be about $1 per dozen over the prices which have been ruling.

Hatchets.—The arrangement between the manufacturers, to which we referred in our last issue as practically consummated, has been completed and is now in active operation, including most of the leading manufacturers, with only a few concerns outside. The classified lists of buyers, according to which the prices will be determined, are not yet issued, but it is understood that they are compiled and will soon be sent out. It is expected that the associated manufacturers will discourage as much as is possible the making of special brands, in hope of correcting some of the abuses in this matter from which they and the trade at large have suffered. It is hoped that one of the results of this combination will be to put the manufacturers into better shape in this respect. Their organization is a strong one, regulating prices and production, and in its general features resembles the Shovel Association.

Henry Disston & Sons.—Henry Disston & Sons, Philadelphia, have just issued, under date of January 1, their discount sheet applying to 1904 catalogue, which is also in process of distribution. The discount sheet gives quotations on the extensive line of Saws and other tools manufactured by the corporation, a few changes in price having been made.

Cordage.—Demand is reasonably good for the season, which is probably all that could be expected. The market appears to be well sustained. Quotations on the basis of 7-16 inch diameter and larger are as follows: Pure Manila, 11½ cents; second-grade Manila, ½ to 1 cent per pound lower; Pure Sisal, 9¼ cents; Mixed Sisal, 8 cents per pound. These quotations are subject to a rebate of ¼ cent per pound to carload buyers.

Paris Green.—There is but little demand for Paris Green, owing to the quantity that was carried over last season. For Arsenic kegs or casks, a base price of 11 cents is generally quoted, but irregularities in advances exist among the different manufacturers.

Glass.—While the two organizations of Glass workers agreed upon a scale of wages which was accepted by the manufacturers on November 5, 1903, some factories had begun making Glass previous to that time, and had agreed with their workers at a lower rate of wages. A movement is now on foot looking to the amalgamation of the two organizations, and the securing of a new president, other than the two now holding office, who, it is believed, can straighten out the unfavorable conditions which now exist among the rival organizations, and put a universal wage scale in force. Some factories are sending out stock sheets in answer to inquiries, and are quoting 90 and 5 per cent. discount from the manufacturers' list. Sometimes a slightly lower figure is obtained if the assortment to choose from is not desirable, or if the manufacturer is anxious to make sales. For buyers' specifications, 90 per cent. discount appears to be about the best price named for car lots. Local jobbers held a meeting during the past week, but decided that there was not enough business to agree upon any schedule of prices. Quotations range from 90 and 10 to 90 and 20 per cent. discount from the jobbers' list of December 16, 1902, and on desirable orders better figures are sometimes obtainable. There was quite a general feeling at the meeting that prices should be stiffened up.

Oils.—*Linseed Oil.*—Under date of January 27, crushers announced a 2 cent advance in the price of Linseed Oil, as follows: City Raw, in lots of five barrels or more, 42 cents; in lots of less than five barrels, 43 cents per gallon; State and Western Raw, 40 to 41 cents per gallon, according to quantity. Boiled Oil, the usual 2 cents advance per gallon over Raw. These prices are reported as being more or less nominal, as it is reported that Oil has been offered this week at from 1 to 2 cents below regular quotations. The Seed market appears to be in strong hands, but buyers of Oil are generally purchasing in small lots.

Spirits Turpentine.—During the week prices have fallen off about 4 cents per gallon at Savannah, the drop being attributed to restricted buying and the consequent accumulation of stocks. It is reported that the cutting of boxes in the Turpentine may be restricted, as higher wages are being offered labor in other occupations. If such should prove to be the case, it will have a material effect on prices. At this point buyers are generally confirming purchases to small lots, but buying is more active. Quotations, according to quantity, in this city are as follows: Oil barrels, 64 to 64½ cents; machine made barrels, 64½ to 65 cents.

THE annual meeting of the Dillon-Griswold Wire Company was held at the company's office in Sterling, Ill., on the 20th ult. The following officers and directors were elected: C. M. Wicker, president; Sanborn G. Tenney, vice-president; Chester Griswold, treasurer; Robert McCosh, secretary and assistant treasurer; H. C. Wicker, general manager, and C. M. Wicker, H. C. Wicker, Sanborn G. Tenney, Chester Griswold and W. M. Dillon, directors.

THE DAISY MFG. COMPANY, Plymouth, Mich., have purchased the Air Rifle business of the J. A. Dubuar Mfg. Company, Northville, Mich, and will continue to operate that plant as a branch. This purchase gives them three complete lines of Air Rifles—the Daisy, Sentinel and Warrior.

THE report which has obtained some currency that the Beall Shovel Company, Alton, Ill., have shut down their plant is without any foundation whatever. The company advise us that their plant is in full operation, their factory not having been shut down since they started three years ago, except on holidays, and a part of the time they have been running at night. With their manufacturing facilities they are able to hold their own and take care of their customers in face of the active competition with exists.

FRANK HIBBARD, not Frank G. Hibbard, as stated in a recent issue of *The Iron Age*, is the fourth vice-president of Hibbard, Spencer, Bartlett & Co., Chicago.

Trade Organizations.

National Sash Weight Manufacturers' Association.

The National Sash Weight Manufacturers' Association held their annual meeting on the 2d inst. in Philadelphia. The business meetings of the association, which were all of an executive nature, were held in Parlor A of the Hotel Walton. Elmer E. Brown, the president, opened the meeting with an address, reviewing the past year's business. The election of officers for the ensuing year resulted as follows: President, Elmer E. Brown of E. E. Brown & Co., Philadelphia; vice-president, Henry Doerr, Western Foundry & Sash Weight Company, St. Louis, Mo.; secretary-treasurer, J. C. Brainerd, the Johnson & Jennings Company, Cleveland, Ohio; Executive Committee: B. H. Fry, B. H. Fry & Co., Waterbury, Conn; Geo. Buchanan, Allegheny Foundry Company, Pittsburgh, Pa.; J. E. Price, the Price-Evans Mfg. Company, Chattanooga, Tenn.; Jas. Green, S. Green & Sons, Des Moines, Iowa. After considerable deliberation, Cleveland, Ohio, was selected as the next place for the annual meeting.

The annual dinner of the association followed the meeting and was held at Boothby's, Thirteenth and Chestnut streets. Addresses were made by J. C. Brainerd, Henry Doerr, W. A. Ross, Edwin Stevens, J. E. Price, B. H. Fry, J. W. Bates, George Buchanan and others. E. E. Brown filled the difficult position of toastmaster in his usual happy manner. Those present were as follows:

E. E. Brown, Philadelphia.	J. H. Brooks, Bristol, Pa.
J. C. Brainerd, Cleveland.	J. C. A. Fox, Philadelphia.
Henry Doerr, St. Louis.	Dan'l Koch, Philadelphia.
W. D. Goodwin, Baltimore.	Geo. Buchanan, Allegheny, Pa.
Mr. Curtin, Alexandria, Va.	F. A. Buchanan, Lebanon, Pa.
A. A. Tanner, Waterbury, Conn.	Geo. Kramer, Dayton, Ohio.
Thos. Devlin, Philadelphia.	W. A. Ross, New York.
Wilmer Krusen, Philadelphia.	W. E. Price, Chattanooga, Tenn.
Frank Hammond, Philadelphia.	Jno. Lewis, Brooklyn, N. Y.
W. H. Magoffin, Philadelphia.	Edw. Stevens, Brooklyn, N. Y.
Joseph Sutton, Philadelphia.	J. W. Bates, Baltimore.
T. D. Hooper, Philadelphia.	B. H. Fry, Waterbury, Conn.
C. R. Brown, Philadelphia.	Albin Garrett, Philadelphia.
Geo. Fox, Philadelphia.	Edw. Fox, Philadelphia.
Howard Evans, Philadelphia.	Thos. Hobson, *The Iron Age*, Philadelphia.
N. P. Reed, Boston	
N. H. Reed, Boston.	August A. Miller, *The Iron Age*, Philadelphia.
T. B. Harkins, Bristol, Pa.	

The dinner proved to be a most interesting occasion, and was thoroughly enjoyed by the members of the association.

New England Iron and Hardware Association.

The annual dinner of the New England Iron and Hardware Association will be held at the Hotel Vendome, Boston, on Thursday, February 25, at 6.30 p.m. The principal speakers of the evening will be Congressman Henry B. Clayton of Alabama and Judge Walter I. Smith of Iowa. Other speakers have been invited to address the gathering, and a very large attendance of men prominent in the Iron, Steel and Hardware field is anticipated.

Pennsylvania Retail Hardware Dealers' Association

An attractively printed souvenir programme has been issued in connection with the third annual meeting of the Pennsylvania Retail Hardware Dealers' Association, which is to take place on the 16th and 17th inst., at the Park Hotel, Williamsport, Pa. The convention will open on the morning of the 16th with an address of welcome by Hon. John F. Laedlein. An executive session will follow, at which reports will be made by the president, secretary and standing committees. In the afternoon addresses will be made by W. P. Bogardus, president, and other officers of the National Association. The Question Box will also occupy the attention of the members. At an open session on Wednesday morning T. James Fernley, secretary-treasurer of the National Hardware Association, will make an address. The closing session, executive in character, will be held in the afternoon, the feature of which will be an address by George V. Thompson of Mount Jewett, Pa. In the evening the annual banquet will be enjoyed. During the year this association has added about 50 new members, and a large attendance is anticipated at the meeting.

DECORATING A SMALL WINDOW.

BY GEO. GROOS.

WHILE handicapped in making elaborate window displays, by the small size of our show window, which only measures 3½ x 5 feet, we generally get satisfactory results by exhibiting goods on a series of raised boxes, covered with black or brown plush, according to the class of goods shown. The acompanying illustration shows our window arranged for a Tool display. The partition separating the window space from the store is of boards covered with plush, and hinged at one side with loose butts, so as to open as a door. It extends about 5 feet above the store floor. Above this partition is generally hung a mirror or a picture showing the factory in which some of the goods exhibited are manufactured. Two 32-candlepower drop incandescent lamps supply ample light for the window. In arranging the display small articles are generally fastened to the plush covered hinged background, while the large and heavy ones are placed on the boxes in the window, or on the window floor.

Decorating a Small Window.

F. A. Powers & Co., Norwalk, Ohio, have disposed of their large business, established in 1876, to Norwalk Hardware Company, Henry C. Breckenridge, manager. Mr. Breckenridge was for a number of years in the Hardware line at Plymouth. He also served one term in the Ohio House of Representatives, and for some years was identified with the canning factory of E. P. Breckenridge & Co., of Toledo. Messrs. Powers and Moir, the latter the junior member of the old firm, have not yet decided on their future plans, but have no intention of leaving Norwalk.

One hundred and fifty Pocket Knives, 45 Razors and six sets of Carvers were stolen from the store of Borneman & Sons, Elkhart, Ind., on the night of the 15th inst. A reward of $25 has been offered for the arrest and conviction of the thieves.

Letters from the Trade.

A cordial invitation is extended to manufacturers and merchants to make use of these columns, in calling attention to matters of general interest, in requesting information or expression of opinions on trade questions, and in advising us in reply to inquiries of our correspondents.

Inquiry for a Stock Ledger.

FROM MERCHANTS IN IOWA.—We desire some suggestions as to a stock ledger or plan for keeping a correct account of all merchandise purchased, itemized and classified, and also of all sales of such articles, so that an inventory may be had at all times of actual stock on hand of each article in the Hardware line. As illustration, we wish a book to be charged with a bill of Horseshoes, specifying the various makes and sizes as received, and to be credited with daily withdrawals.

Prosperity and the Catalogue House?

FROM HARDWARE MERCHANTS IN THE STATE OF WASHINGTON.—The more prosperous the farmer is the worse it is for the dealer. As long as the farmer needs credit and the dealer will carry him, he will trade with the local man, but just as soon as he gets a little money ahead he is off to the catalogue house.

Plumbing and Heating Goods.

FROM A MERCHANT IN INDIANA: We find an increasing demand from the wealthier farmers for modern bathrooms, hot water heating plants and hot air furnaces, and would advise our brethren in the trade to develop this new and important branch of the business.

Mechanical Man for Show Window Display.

We take pleasure in referring to our readers the following appeal for information, which comes from an Illinois Hardware merchant. Relating as it does to the matter of effective show window display, any advices elicited will be of interest to merchants generally:

I would be pleased to receive suggestions as to a mechanical man for operating various tools, such as Breast Drills, Saws, &c. This "man," I think, if same can be made to operate at a small cost per day, would be very useful in window displays; electric motor or clock work would be very good if inexpensive.

Ordering by Mail.

FROM AN OHIO MERCHANT: I am ordering more than two-thirds of my goods by mail, and think if we all followed up mail ordering we would not overstock ourselves so badly. I cannot see why we cannot get as good prices. My experience is that we have to watch as well as pray in buying goods.

"Careless Packing."

FROM MANUFACTURERS OF HOLLOW WARE: Of all the hard nuts to crack we think none more aggravating than the buyer who charges careless packing. We have been packing one kind of castings for 40 years; yet, no matter what causes the breakage, the cry is "careless packing." We have in mind a complaint that "the transportation company are not responsible, for the evidence of the goods being loose in the package shows that they were simply thrown in." Then party recites that casks were broken. Now it never occurred to the consignee that if cask fell from sling into a vessel's hold or had other violent handling, and a few pieces were broken, or if package was broken open and contents spilled, the same would be put back without regard to order. The fact also that casks were smashed did not seem to occur to the buyer as evidence of cause and effect. We confess we are very tired of the careless packing class of claims, and, with full knowledge of our non liability, we will not entertain such claims. What does the trade think of it?

Direct Dealings with Manufacturers.

FROM A LEADING MERCHANT IN NEW YORK STATE: I believe the tendency is toward direct dealing with the manufacturers on the part of the retail merchants, especially if a man is awake to the situation. I don't buy anything of a jobber that I can buy from a manufacturer, even if I have to pay the manufacturer the same price, because I desire to establish my identity with the trade and with the manufacturers, and I believe that when goods are purchased from a jobber a man loses this acquaintance with the manufacturer. Jobbers are all right in their place, but I don't see why it is absolutely necessary for the retailers to give up everything to the jobbers.

Some of the old manufacturers tie up very closely with the jobbers and, I believe, stand in their own light. I remember that several years ago I needed some well-known goods and sent a mail order to the jobber, requesting him to ship at once, as in the order there were Tools which we had carpenters waiting for. I thought the order was too small to send to the manufacturers, and after waiting about three weeks I wrote the jobber and found that he had sent the order on to the manufacturers, and in the course of a week I received about half of the goods, and the Tools were not in the shipment. I immediately canceled this order with the jobber and ordered the Tools from another jobber by express. The following morning I received one by express from the jobber, and the next day I received one from the manufacturers' New York house by express, and in about a week I received the remainder of the order by freight, making four shipments of one small order. The cost of getting the goods was more than the profit on them.

The trouble is that in New York State the retailers are not organized the way they should be. The jobbers have control of the situation and the manufacturers give up everything to them.

Should Manufacturers Sell the Jobbers Only?

FROM MERCHANTS ON THE PACIFIC COAST: Should manufacturers sell to jobbers only? We say no. For two reasons. The first is, there are no jobbers we know of. Not one. Everywhere there are large dealers, who style themselves jobbers, but who sell to any large consumer, and leave the small consumer for the retailer. The second reason is a very serious one, more so than most retail dealers have any idea of. Let the manufacturer agree to sell only to jobbers and within five years a large retail store would be a thing of the past. We know it is the policy of the coast jobber to induce as many small grocery stores as possible to handle Hardware, and the only salvation for the large retailer is the manufacturer.

Retailers and Syndicate Buying.

FROM A HOUSE IN MINNESOTA: We think the only thing that is likely to do away with the traveling man will be syndicate buying, and we do not know whether that is a good thing or not. We find that we can always buy to better advantage from the traveling man than we can from the house direct, as the man knows a good deal better what competition he has to meet. We think, however, that the only salvation for the retail dealers is to find some way to bunch their orders so that they can come nearer to buying as low as the catalogue houses do.

The Retailer's Troubles.

FROM A MINNESOTA MERCHANT: In our opinion, the rural free delivery is a good thing only for the farmer, but hard on the business men of the smaller cities and towns. Should the Parcels Post bill go through, it will be another hard blow to local dealers, and a man must become one of three things: a monopolist, a farmer or a day laborer.

Level Prices.

FROM A NEBRASKA HOUSE: If it is advisable for the manufacturers to agree to enforce a level price among jobbers or themselves, on Nails, for instance, they ought to extend the arrangement to the retailer, and frame a

price below which he shall not retail them on penalty of the supply being cut off.

Quantity Discounts to Favor Large Jobbers.

FROM AN ENTERPRISING HOUSE DOING A WHOLESALE AND RETAIL BUSINESS: There appears to be a growing disposition on the part of the larger manufacturers to increase the quantities that they require a dealer to purchase before he is recognized as a full fledged jobber, so much so that many of the smaller jobbers, in order to meet competition, are compelled to buy a larger amount of goods at a time than their trade actually warrants. The consequence is capital is tied up for a longer time than it should be.

A jobber with two, three or four men on the road cannot take the quantities prescribed by many of the manufacturers without taking a larger quantity than he really needs, and cannot turn it over as often as he should to make the stock in such lines a paying investment. As the writer sees it, the smaller jobbers are the friends of all manufacturers. They come nearer being in personal contact with their customers than the managers and buyers of the very large houses. They often take up a new thing as a trial and put it on the market and push it, to the benefit, of course, of the new manufacturer. The small jobber is a very valuable distributer for the manufacturer, and, in my opinion, the manufacturer is better off with ten small jobbers on his books who travel four men each than he is with a large house who travel 40 men, for the reason that if either of the smaller jobbers should drop the manufacturer he is not affected so much. If any one of them fails the manufacturer doesn't lose much. They will take pains to present new goods and establish a market for them that a large jobber will not do until the trade is established.

In my opinion, if a dealer is well rated and has two or more men on the road continuously and is recognized as a jobber, he should receive the jobbing price, whether he is able to take 1000 dozen or only 100 dozen of an article. The smaller jobber cannot do business on a smaller percentage than the larger jobber, and it costs him just the same to sell his goods, as he usually sells smaller amounts to smaller trade. As a legitimate agent necessary to the success of the manufacturer he should be treated with more consideration. Many of the larger manufacturers have made a serious mistake in putting the quantity so high that the small jobber cannot reach them. He accordingly takes up the lines of some new manufacturer who has his reputation to make, and thus puts the new manufacturer in a position where he must be recognized by the older established manufacturers.

As a single instance of what the smaller jobber can do for the large manufacturer, with whom he is practically prohibited from doing business on account of the large quantities he is required to take and the conditions under which he is required to take them, behold the Shovel Trust and their present plight. With the rules governing the sale of their goods by the jobbing trade any one who started a Shovel factory was sure to meet with a good trade. The prospects were so good that the country is full of Shovel factories.

If the smaller jobbers throughout this broad land would agitate this matter and see what a loss of business results from these methods, and demand prices that would enable them to do business in competition with the larger houses in their territory, they would take a long step in the right direction to correct the disadvantages under which they labor at this time.

Clear and Easily Read Labels.

FROM A MERCHANT IN MISSOURI: I have not noticed anything for some time past in *The Iron Age* in regard to urging manufacturers to label their packages so as to make plain reading. It is so strange they will persist in putting on labels printed on very dark red or dark blue paper with black reading; it hurts the eyes to look at them, and you have to get very close to make out the name of the article. It would cost no more to do the work right, so that you could tell what is in a package without getting up on a ladder. I can, sitting at my desk, read without trouble some labels 20 feet away, while others have to be within 1 foot.

Gradual Reduction in Prices Advantageous.

FROM A NEW ENGLAND DEALER: I believe a gradual reduction in price of goods, particularly in those lines supported artificially, will do more than anything else to start building in this locality. Belief is general here that we are required to pay high prices in order to furnish dividends on wind in many lines, and the old principle of "millions for defense, but not a penny for tribute" has a certain influence.

An Unwise Policy.

FROM A MERCHANT IN NEW YORK STATE: The disposition on the part of the makers of some classes of goods, such as Poultry Netting, Ice Cream Freezers and many other lines, to make advances over last and several preceding years, in the face of much lower prices for metals and a general lowering of the wage scale, does not tend to inspire the confidence of the retail trade in their ability to maintain them, hence conservatism follows. Then, too, all the depressing conditions have been freely heralded throughout the land, so that the consumers are shocked to hear any intimation of an advance on any goods, causing them to buy with much less freedom.

Retailing by Jobbers.

FROM A MERCHANT IN VERMONT: We note a disposition on the part of some jobbing houses to retail what goods they can, even in territory where they sell the dealers, and often at prices nearly as low as the small dealer obtains. This is having a bad affect, and we hope to see such methods discontinued.

RACINE STEEL & IRON COMPANY.

THE RACINE STEEL & IRON COMPANY, Racine, Wis., have purchased the Skein business of the Sandage Steel Skein Company, South Bend, Ind., the Columbus Skein & Iron Company, Columbus, Ohio, and the W. B. Mitchell Skein & Foundry Company, Grand Crossing, Ill. They have increased their capital stock to $500,000 and purpose enlarging their Racine plant materially. It is their purpose to concentrate the business of the four concerns into one or two plants in order to decrease the cost of production. This purchase makes them the largest producers of Wagon Skeins in the United States. Ex-Senator James K. Jones of Arkansas and J. G. Johnson of Peabody, Kan., both members of the Democratic National Committee, have large interests in the Racine company, Mr. Johnson being president.

TOWER & LYON COMPANY'S NEW CATALOGUE.

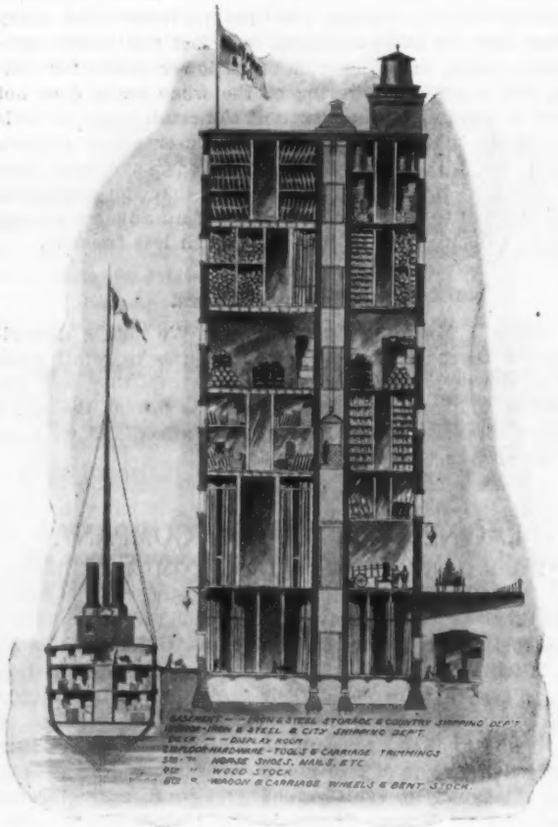
TOWER & LYON COMPANY, 95 Chambers street, New York, have just issued illustrated catalogue No. 12 of the Fine Tools, Hardware Specialties and Police Equipments made at their factory in Bloomfield, N. J. Among new goods are the X. L. Miter Box, Converse Patent Compass Saw, and Perfection Plumb Bobs. Other well-known goods are Chaplin's Planes, Champion Screw Drivers, Expansion Bits, Saw Clamps, Nail Pullers, Wrenches, Belt Punches, Gauges, Protractors, Plumbs and Levels, Drills and a large number of kindred goods. They also represent directly the Union Hardware Company, National Vise & Tool Works and International Glue Company, and carry stocks of their goods.

WIRE CLOTH PLANT TO BE REBUILT.

THE NEW FREEDOM WIRE CLOTH COMPANY, New Freedom, Pa., whose plant was destroyed by fire a short time ago, intend to rebuild as soon as weather will permit. They hope to have their new works in operation early in the summer.

KELLEY, MAUS & CO.'S NEW WAREHOUSE.

The accompanying illustration gives a sectional view of the new warehouse of Kelley, Maus & Co., Chicago. This warehouse is 70 x 375 feet, 100 feet high, of which 28 feet is the basement, in which is stored iron and steel bars, stood on end. The building faces West Lake street at the western terminus of the bridge across the Chicago River, and stands between the river itself and North Water street, which street is occupied by the Chicago, Milwaukee & St. Paul, the Pennsylvania and other railroad systems. The location of the building and its construction permit of the economical handling of materials in and out, either by water, rail or wagon. The house also have a lumber yard and branch supply house, with 700 feet frontage on Blue Island avenue, between Wood



Kelley, Maus & Co.'s New Warehouse.

street and Paulina avenue, with switch track to the main warehouse. They are large dealers in heavy hardware, wagon and carriage makers' supplies and kindred lines. They moved into their new warehouse last Summer, but have only recently completed all its inner details.

S. F. BOWSER & CO.

THE sixth annual gathering of the salesmen of S. F. Bowser & Co., Incorporated, Fort Wayne, Ind., manufacturers of the well-known Bowser Self Measuring Oil Tank, was held last week at the company's office. Over 70 salesmen from all parts of the United States and Canada were present and participated in the discussion, and all the salesmen were fully informed regarding the latest improved outfits. The convention lasted for three days, and terminated with a banquet on Friday evening at the New Aveline Hotel. The *menu* was all that could be desired, and the responses to toasts were very humorous and interesting. The *menu* card was especially gotten up as a souvenir, the first page showing portraits of the officers and managers. The meeting was a most interesting and enjoyable affair, and the salesmen go to their respective territories more enthusiastic than ever regarding the merits of their goods, the present line being referred to as far in advance of anything heretofore offered by the company.

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BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE, NORFOLK ST., LONDON, W. C., January 23, 1904.

The Week's Hardware Trade.

NEW YEAR orders are neither plentiful nor remunerative, but they are coming in better than for some time previous. The mild open weather continues favorable to building and other outdoor employments, and this tends to raise the average demand for Tools, Structural Material, Fencing and Drainage Appliances. The special requirements of Japan, in view of a possible conflict with Russia, have led to many orders of carrying character, from Machinery to Light Lathes, and Rifles galore. The Japanese are also buying a considerable quantity of machinery suitable for the manufacture of the new service magazine Rifle. The Birmingham Small Arms Company have received an order for 75,000 Rifles from the British Government, and this, with other orders in hand, plus supplementary orders to come later, should insure regular employment for the next two years. Not only are our regular forces to be armed with the new service Rifle, but also the volunteers, and probably both Indian and Colonial troops. Carriage Lamp manufacturers are busy, one notable feature being the large demand for Motor Lamps, notwithstanding the keenness of French and German competition in this line. There is considerable activity in motor works, and the Cycle trade shows some stimulation. Orders for the Cycles are almost invariably of the cheaper descriptions, suitable for working class use. There has been some revival in the Brass foundry trades since the holidays, but nothing to boast of. Tubular Brass Work sells very well just now, and the makers of Stair and Curtain Rods are busy, doubtless in anticipation of spring cleaning. On overseas account good indents have come to hand from Argentina and Brazil. Canadian and Indian trade is well sustained in the Hardware lines, and there is an improvement in Australian orders. South African trade still continues irregular and largely unhealthy.

British Conservatism a Hindrance.

John Shaw of John Shaw, Limited, the Yorkshire Wire Rope and Fencing works of Sheffield, has just returned from a visit to South Africa, whither he went in August last year, visiting the principal towns. He comes back with the dominant impression that unless British manufacturers adapt themselves to the requirements of the country they will lose the vast bulk of the trade. He thinks that Great Britain does not now get her fair share of orders, and attributes the blame to British manufacturers in not adapting themselves to South African requirements. He says that America and Germany are always ready to do this, with the result that they are increasing their hold in South Africa at the expense of the Britisher.

CURRENT SOUTH AFRICAN CONDITIONS.

My point here is to draw attention to his remarks on the general condition of the country, which he says at the present time is passing through a period of great depression. The markets are overstocked and large numbers of people are unemployed. He warns those who are thinking of emigrating to the new colonies to hesitate; to wait until matters assume a more satisfactory condition. "South Africa is not the El Dorado some people think it is," he says, "and when they get there they find their mistake when it is too late." Not only in the coast towns, but up country in the great mining centers, this depression exists. There was a great rush after the war; goods and materials were sent from north, south, east and west, and now the markets are full of goods. Many good buildings have recently been erected, but owing to the slackness of trade, other operations have been suspended, and projects to commence new works are being held in abeyance. "South Africa," Mr. Shaw adds, "will turn out one of our finest colonies, but during the war everything was disorganized, and time must elapse before everything can again assume a satisfactory condition. The railways are probably being developed, but more of them will be required before the country can be properly opened out." He speaks highly of the buildings in Rhodesia, and believes when the depression passes away there will be a good opening for British trade in that country. The railways will open out a country which has hitherto been inaccessible to the British trader.

ASIATIC LABOR IN SOUTH AFRICA.

The introduction of Chinese labor into the mines is the one great topic of conversation in the mining districts, says Mr. Shaw. The great difficulty in connection with the mines is the scarcity of labor. At first many of the large employers in the country held out against the introduction of the yellow man from the East, but they are beginning to realize that this must take place. Mr. Shaw thinks that if the Asiatics are selected, well looked after, and properly cared for and treated with firmness but justice, little or no difficulty will follow their introduction into South Africa. "To my mind," he adds, "nothing could do more to induce the Kaffir to return to work. The black boy will not like to see his labor taken from him by the Chinaman. At present the mines are standing, and something will have to be done to meet the difficulty."

CAPE COLONY AT PRESENT.

In conclusion, Mr. Shaw says a few words about the state of the people in South Africa. He says there is still some unrest, principally in some parts of Cape Colony, where the people are dissatisfied, probably in consequence of the great depression. But the great majority of the population are settling down, and with a return of good trade he believes England will find herself possessed of a great and wealthy colony, to which she will eventually be able to send a portion of her surplus population.

The Lawn Mower Agreement.

It is authoritatively stated that at least four of the five firms who, for the last three years, have been parties to the understanding fixing the maximum discount which may be deducted from their list prices of Lawn Mowers by retailers, have consented to continue the agreement for another year. The firms referred to are Thomas Green & Sons, Limited, Leeds; Ransomes, Sims & Jeffries, Ipswich; John Crowley & Co., Sheffield, and Alexander Shanks & Son, Limited, Arbroath. The terms of the agreement are that not more than 15 per cent. discount will be allowed for cash with order, or 10 per cent. for credit transactions.

Tube Makers' Prices.

Your readers are already aware that some attempts have been made to bring about an international agreement among Tube makers to put an end to the present ruinous competition. Up to now these efforts have not proved successful, but it is thought that an important point has been gained by the successful result of the efforts made to bring about an export syndicate in the Gerkan trade. This export syndicate is now in operation, and will deal with and distribute the orders received among the various makers. This may prove to be the first step in bringing the negotiations regarding an international arrangement to a head.

Domestic Engineers and Plumbers.

What is practically a new association of hot water engineers has been formed under the presidency of D. M. Nesbit. This new organization is expressly for the purpose of meeting the opposition of the plumbers. The chairman, in his opening address, remarked, in regard to the plumbers, that so far as lead pipe service was concerned they did not wish to disturb the present methods, but they must see to it that no body of men could claim the monopoly of running pipe work in any other metals. It is intended by those behind this association to treat the claims of the plumbers with some militant brusqueness.

The I. F. A. Ironmongery Examination.

I have already kept readers of *The Iron Age* informed of the examination scheme started by the Ironmongers' Federated Association of Great Britain. The first examination was held this week at the Manchester School of Technology, the candidates in most cases being entertained as guests by local ironmongers. The morning

sitting was devoted to answering questions in writing. The afternoon session was divided between optional subjects and *viva voce* examination, with practical counter work. This latter seems to be interesting. Hardware and Nails were arranged in the School of Technology to demonstrate shop and warehouse methods in a practical way. The compulsory syllabus gave candidates a good deal of trouble, the papers being regarded as distinctly stiff, but the optional subjects stirred more enthusiasm. Perhaps the same idea may sooner or later be carried out in America, and it may be well, therefore, to put on record the 16 questions which candidates had to answer:

Question 1 dealt with handwriting and orthography, which were to be judged from the written papers. The further items in this question related mainly to the working out of calculations regarding discounts and prices for varying quantities, the net profits and the average gross profits on turnover; the books that ought to be kept in an ironmonger's business, and the posting of a parcel of goods sent out on approbation, some of which were returned and the balance retained.

Question 2 tested the candidates' knowledge as to zinc and corrugated sheets for roofing.

Question 3 dealt with the quantities of roofing felt and sheet lead required to cover special forms of roofs, and related to the value of certain quantities of perforated zinc.

Question 4 concerned the weight of certain specified bar iron and the cubic capacity of tanks of given dimensions, and of divided corn bins.

Question 5 asked for particulars regarding the fluxes to be employed for welding iron, brazing a Key, and soldering a Tin Kettle, and replies were asked as to the reason for not using Copper Rivets for riveting a galvanized iron Tank. It was also asked what was understood to be a good mixture for tinmen's solder for general purposes, and what tools a man would use in riveting up two iron plates.

Question 6 required descriptions to be given of various types of Locks and Latches.

Question 7 related partly to the same matters, and also required a description of how to quote for black ironmongery suitable for kitchens, the quantity of brassfoundry required to furnish a bay window, and the drawing up of a stock order for Screw and Socket Castors.

Question 8 related to the gauges in use in connection with round Wire and Nails, and a list of the nails usually supplied to builders, slaters, upholsterers and cabinet makers. Sketches were also required of some of the various shapes of Bolt and Nut heads and of the standard Bolt screw pitch.

Question 9 was intended to test the candidates' knowledge of cabinet makers' tools, and related, among other matters, to Panel and Tenon Saws, the difference between a Hand Saw and a Rip Saw, and asked for a description of a Bull Nosed Rabbet Plane, an ebony combination Miter Square, a Draw Knife and a Marking, Cutting and Mortise Gauge; together with details of the six different kinds of materials from which Table Knife Handles are made, the names of ten different patterns of Scissors, and a sketch of a Pruning, Budding and Wharncliffe Blade.

Question 10 required replies as to how a round tinned Frying Pan and galvanized Waterloo should be measured, and what a Stock Pot was; also what would be supplied to a lady starting housekeeping as a selection of Saucepans, Kettles and Frying Pans; and the making up of an order for a traveler for galvanized Hollow Ware.

Question 11 required a sketch of the bottom of a Currant Sieve and Raisin Sieve, and information as to the various descriptions of galvanized Fencing and other Woven Wires.

Question 12 dealt with gas fittings.

Question 13 was concerned with table lights, renewals of parts in Kitchen Ranges, and materials for special Bell fitting requirements.

Question 14 dealt with the standard weights and measures and their usual divisions.

Question 15 required descriptions of various safety and other Lamps.

Question 16 dealt with the usual sizes for wood measures, with marking and lettering to pass the weights and measures' Inspector, together with a sketch of a measure stamped ready for sale and use. The question also called for replies regarding the usual length and thickness of a Broom Handle, and what was the best kind of wood for Chisel Handles.

The practical part of the examination to which I have referred was more to the taste of candidates. For example, they were required to name the makers of various Files picked out from a bundle, and to state of what materials the handles of various Table Cutlery were composed; also to give the names of Keys from a bunch shown, and to name various Locks and Latches and the fittings connected with them, together with a number of articles of brass foundry and black ironmongery. They were also required to state the weight, respectively, of Galvanized Nails and Washers which would be sent out to an order of a given gross weight, and were required to weigh out and name several different kinds of Nails. Questions were also asked with regard to window dressing.

Trade Possibilities in Germany.

The current *Bulletin* of the American Chamber of Commerce in Berlin contains the following paragraph:

The number of articles likely to find favor in the eyes of the buying public of Germany is, as a matter of fact, very large. Household Furniture of medium and of first-class quality, which ought to be turned out cheaper in the United States and sold here at a good profit, is scarcely to be found in German stores, with the exception of office Furniture, which is acknowledged by Germans themselves to be better and more capable of resisting the German climate and wear and tear in general than the German make. There is no doubt that other kinds of Furniture would find equally ready buyers. Care should be taken, however, as in the case of all articles in competing lines of manufacture, to consult German taste and also the uses to which such Furniture is to be put. For instance, closets in German houses are almost unknown, Wardrobes being exclusively in vogue. American manufacturers should not try to force their special styles of Wardrobes on Germans. All kinds of American kitchen Furnishing Goods and labor saving machines, excepting Ice Cream Freezers, which latter do not take with Germans, will be sure of a good sale. Pretty and tasty cotton dress goods and calicoes would sell, provided no gaudy colors were included. The best and surest way to make certain a foothold in the German market, in whatever line, is to send over good men to study the wants of the Germans, men who know a good thing when they see it.

AUSTRALIAN NOTES.

FROM A SPECIAL CORRESPONDENT.

THE chief characteristic of the month of November has been the heavy demand for harvest requirements of all kinds. The sale of Reapers and Binders throughout the States for this year's crop has been a record one. Your correspondent hesitates to state the number said to have been sold, but makers have undoubtedly had a rosy time. Binder Twine, at moment of writing, is, figuratively speaking, almost as precious as gold.

REQUIREMENTS OF A PHENOMENAL HARVEST.

Local manufacturers had stocked up for a good harvest, but were unprepared for a phenomenal one. Factories are going night and day to overtake the demand, and farmers are complaining daily because their orders are being filled in instalments. New Zealand importations are coming forward, and the market will soon ease. Harvest tools are rather scarce, and consequently high priced.

FRUIT CANNERS AND DAIRY FARMERS PROSPEROUS.

The fruit season is now on us, and Canning Requisites, Tin Plates, Preserving Jars, &c., are in good demand. Dairy farmers are sharing in the general prosperity being so rapidly brought about by the improved climatic conditions. The drought has broken, and the coming Christmas trade for retailers will undoubtedly be much ahead of recent years.

SOME RESULTS OF THE DROUGHT.

And yet—and yet—amid our hopeful anticipations, we must not forget that even now, in some of the "wayback" country of New South Wales, out beyond Mossgiel, there are stations still absolutely deserted where ten years ago were tens of thousands of sheep. But, taking the Continent as a whole, the recovery has been little short of marvelous.

THE BUILDING TRADES.

The building trade is, on the whole, fairly good, and the outlook even better. Cartland's of Birmingham, England, have just sent out a special representative with a very attractive set of samples in Door and Lock Furniture, Fire Sets, &c. The Reading Hardware Company of Reading, Pa., have set the pace in brass foundry these past few years.

TARIFF DECISIONS.

Tariff decisions of import during the month are: Rotary Knife Cleaning Machines, 20 per cent.; Hand Fertilizer Distributors, 12½ per cent.; Door and Blind Clamping Machines, 12½ per cent.; Painters' Scrapers, free.

New Zealand decisions are: Air Compressors, 20 per cent.; Gas or Oil Engines, on wheels, free; Overhead gearing, Plummer Blocks, Couplings and Collars, 20 per cent.

ENGINEERING AND IRON FOUNDING

trades are very quiet, and the more immediate outlook is not too bright. Still, these trades must experience better times in sympathy with the improved condition of other trades. The history of 1903 has been a story of marking time; but, unless some unforeseen climatic trouble spoils our prospects, 1904 should bring us an era of comparative briskness. Irrigating and Harvesting Machinery and Tools will have much closer attention than in the past. The mining industry will also improve considerably, and the general outlook is distinctly good.

HERMAN HALLE of the Goodwin & Kintz Company of Winsted, Conn., has regained his good health and is leaving for an extended Western trip to visit the trade.

TABLE CUTLERY, SILVER WARE AND CUT GLASS.

GEORGE A. STOCKDER, 32 Park place, New York, has established himself at the above address as the representative of four manufacturers of fine Cut Glass, China, Silverware and Cutlery, he having previously been connected with the Meriden Britannia Company branch of the International Silver Company. He is now exhibiting full lines of richly Cut Glass, made by A. L. Blackmer Company, New Bedford, Mass. Another line is that of the Ravenwood China Company, Corning, N. Y., manufacturing delicate patterns of Hand Painted China, such as Vases, Tankards, Plates, Tea and Coffee Sets, Placques, Sugars and Creams, Coffee Pots, Punch Bowls, &c. Still another class is that of Wedding and Holiday Novelties, many of them beautifully hand painted, in Jewel Boxes, Biscuit Jars, Salts and Peppers, Tobacco Jars, Brushes and Combs, &c., known in the trade as the "Belle Ware," made by Carl V. Helmschmied, Meriden, Conn. He also represents the E. H. H. Smith Silver Company, Bridgeport, Conn., who produce artistic Plated Flat Ware and Table Cutlery.

TRADE ITEMS.

THE CRAWFORDSVILLE WIRE COMPANY, Crawfordsville, Ind., held their annual meeting January 21 and re-elected the old Board of Directors. The directors subsequently met and re-elected the old officers for the present year, as follows: President, W. P. Herron; vice-president, Dr. I. A. Detchon; secretary-treasurer, C. D. Voris, and assistant secretary, Richard Schweitzer.

AT the first regular meeting of the stockholders of the Warren Independent Steel Company, Warren, Ill., directors were elected as follows: P. T. Hicks, L. C. Russell, J. L. Graham, C. F. Taylor, Charles Philips, R. C. Cullen, L. H. Buser. The directors subsequently met and elected the following officers: President, C. F. Taylor; vice-president, L. C. Russell; secretary, J. L. Graham, and treasurer, R. C. Cullen. The company have selected a site, and the erection of a factory for the production of high grade Sheet Metal Wares will be begun as soon as weather permits.

THE address of D. B. Woodbury was erroneously given in an item in our issue of January 21 as 22 Randolph street, Chicago, instead of 22 Lake street. Mr. Woodbury reports business as picking up and is convinced that the plan of carrying stocks in Chicago will prove to be profitable to his firm and a great convenience to his customers.

JUDSON BRENNER was appointed general manager of plants in the Middle West at a meeting of the managing directors of the National Steel & Wire Company, held January 27. Included under Mr. Brenner's jurisdiction will be the management of the Dekalb Fence Company and the Union Fence Company, both of Dekalb, Ill. Mr. Brenner has been secretary of the Dekalb Fence Company for the past eight years, before which time he was connected with the Hartmann Steel Fence Company in the East.

AT the annual meeting of the stockholders of the National Can Company of Detroit, Mich., held recently, it was decided to increase the capital stock $60,000, making it now $250,000. Officers for the present year were elected, as follows: President, T. D. Buhl; vice-president, D. M. Ireland; secretary, Neil McMillan; treasurer, F. T. Ducharme. The Board of Directors consists of the officers and the following: Frank W. Eddy, T. E. Wadsworth, Edward H. Nelson and Alexander McPherson.

THE HAYES SAFETY HOOK COMPANY have incorporated, with a capital stock of $10,000, at Chetek, Wis., to manufacture and sell special patented lines of Harness Hardware. The officers of the company are as follows: F. A. Southworth, president; R. H. Mueller, vice-president; G. D. Hayes, secretary.

J. B. HOOPER, for 14 years with the Humason & Beckley Mfg. Company, and also with Pauls Bros. and the Cattaraugus Cutlery Company, 21 years altogether, and W. C. Gilbert, who has had experience in retail Hardware, both in Bermuda and latterly with the Manhattan Hardware & Bicycle Company of New York City, have formed a copartnership, and will open a Hardware and Cutlery store at 307 Eighth avenue, New York, on or about February 15.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses:*

FROM HAST & ZIEBARTH, Wilcox, Neb., who have purchased the Hardware, Harness and furniture business of J. H. Wright.

FROM MARTENS, ROBINSON & Co., Peoria, Ill., who have lately bought out the Hardware, Stove, Furnace, tin and slate roofing business formerly conducted by Wm. Martens.

FROM THE CARBINE HARDWARE COMPANY, Madison, Ga., who have succeeded P. V. Carbine in the wholesale and retail business. The store has been remodeled and brought up to date in its arrangement and appointments.

FROM STRANGE-MCDONALD HARDWARE COMPANY, Lone Wolf, O. T., who have bought out W. R. Roberts & Co., and will continue the wholesale and metal business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Sporting Goods, &c.

FROM NARUM & BURINGRUD, Waukon, Iowa, who have succeeded Narum Bros. in the Hardware, Stove and Sporting Goods business.

FROM THOMAS & LAWYER, South Pasadena, Cal., dealers in Builders' Hardware and Tools, Stoves, Paints, Oils, Lumber, &c.

FROM REID & BLANTON, Lincolnton, N. C., who have bought the Hardware, Stove, Implement, Paint and Sporting Goods business of R. F. Beal & Co.

FROM UNION HARDWARE COMPANY, Union, S. C., who have organized with a capital of $10,000, to carry on the jobbing and retail business in Hardware, Stoves, Farm Implements, Paints, Sporting Goods, &c.

FROM MYLANDER HARDWARE COMPANY, Oak Harbor, Ohio, who are successors to the business formerly conducted by H. C. Mylander and latterly by W. H. Mylander. The firm handle General Hardware, Stoves, Paints, Oils and House Furnishing Goods.

FROM JAS. KIRK, Fairgrove, Mich., who has succeeded O. T. Johnson & Co. in the Hardware, Stove, Paint and Sporting Goods business.

FROM CHAS. HAWK & Co., Ames, O. T., who have bought the Hardware, Stove, Agricultural Implement, Paint, Sporting Goods and Harness business of Geo. Baker.

FROM CENTRAL HARDWARE COMPANY, Portsmouth, Ohio, who are intending to add new lines to those already carried. They will appreciate catalogues, price-lists and quotations from manufacturers of such goods as are now being taken up by enterprising merchants for sale in connection with general Hardware.

FROM BOONE COUNTY HARDWARE COMPANY, successors to Bohart-Morris Hardware Company, Harrison, Ark. It is the intention of the new house to increase the stock of goods carried to proportions which will enable them to conduct a wholesale business, in addition to retailing, in the territory surrounding Harrison. They will also take up a number of new lines, including Buggies, Spring Wagons and Agricultural Implements, and will handle a more complete assortment of Shelf Hardware, Stoves and kindred lines.

METHOD OF ASCERTAINING COSTS OF SEWING MACHINES.

From the National Sewing Machine Company, Belvidere, Ill., who are very large manufacturers of Sewing Machine, we have the following advices in regard to the principles on which they estimate and ascertain the costs of their machines:

It has never been difficult for us to get at the cost of our product with an accuracy that is practically absolute. In other lines of manufacture the problem might be more difficult, but our method as applied to the manufacture of Sewing Machines is briefly as follows: We select 100 machines as a basis; each and every part that enters into the make up of each machine is numbered, and the various different operations on each part are also numbered. We first figure up the exact cost of the material entering into 100 machines. Then we figure the cost of the piece work labor on each of the different operations performed on each piece. Then we add a certain percentage, which is to cover the day labor and all non-productive labor and shop expense of every description, including such items as power, heating, lighting, insurance, taxes, &c. What this percentage should be we have learned with practical exactness from past experiance, and we find that it averages almost exactly a certain amount, which is determined by the number of machines produced each day or each month. Then at the end of the year the total cost of labor, material and shop expense, if divided by the number of machines produced, will certainly give the cost per machine to the factory. As remarked above, by past experience in following this plan we have determined what the right percentage should be that we must add to the bare cost of material and piece work labor to get at the total cost of production. Our figures result in an accuracy that does not vary to exceed under any circumstances 2 to 3 cents per machine, and generally it is much less. Such accuracy is ample for all practical purposes.

Material and Labor

Percentage to Cover Expenses

Another item which we should consider might well be included in the subject is the question of figuring depreciation of plant and equipment. Our method has been never to charge off anything for depreciation, but instead to maintain everything in a state of perfect efficiency, letting the cost of maintenance go into shop expense accounts. For illustration, if we build or buy a piece of machinery we credit our machinery account with the cost. Then later on, when that machine requires replacement or repairs, the cost of doing same goes into our general expense and no attention is paid to it, so that it simply is reflected in increased cost of producing our goods. Maintaining buildings and keeping in order or replacing tools is carried on in the same manner, so that we figure that at all times our plant, machinery and tools are in perfect order and worth as much to us as they originally cost.

Depreciation of Plant

HARDWARE ASSOCIATION MEETINGS.

THE following meetings of State Retail Hardware associations are announced to be held during the next few months:

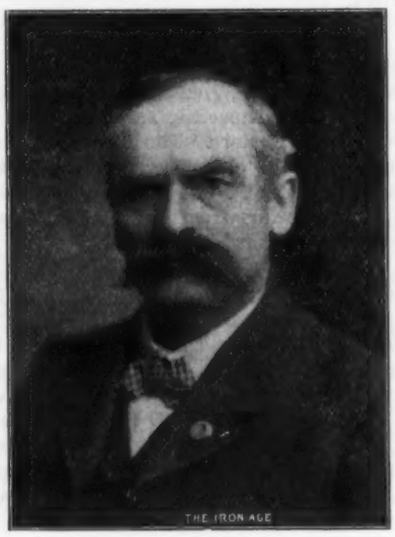
NEW ENGLAND, February 10, Boston.
NEBRASKA, February 9, 10, Omaha.
IOWA, February 10, 11, 12, Des Moines.
COLORADO, February 15, Denver.
INDIANA, February 16, 17, 18, Indianapolis.
PENNSYLVANIA, February 16, 17, Williamsport.
ILLINOIS, February 23, 24, East St. Louis.
MISSOURI, February 23, 24, St. Louis.
OHIO, February 23, 24, 25, Cleveland.
MINNESOTA, February 24, 25, 26, St. Paul.
CALIFORNIA, March 2, 3, San Francisco.
NEW YORK, March 8, 9, 10, Rochester.
NATIONAL, March 15, 16, 17, Indianapolis, Ind.
INDIAN TERRITORY, May 10, Oklahoma City.
ARKANSAS, June 14 and 15, Little Rock.
MICHIGAN, August 10, 11, Grand Rapids.

WISCONSIN RETAIL HARDWARE ASSOCIATION.

THE eighth annual meeting of the Wisconsin Retail Hardware Association opened this (Wednesday) morning at the Republican House, with more than 200 members in attendance—by far the largest attendance in the history of the organization.

The morning session was confined to a meeting of the Executive Committee, and at this session preliminary steps were taken for the formation of a mutual fire insurance company on lines similar to those established in several other States. O. P. Schlafer of Appleton was named as president of the insurance association, C. A. Peck of Berlin as secretary, and H. L. McNamara of Janesville as treasurer, to carry on the work of the association during the present convention.

Every available room in two floors of the hotel was taken up with exhibits of Hardware staples and specialties, these displays being greater in number and more elaborate in detail than at any previous convention.



PRESIDENT FINDEISEN.

The afternoon session, the first general session of the body, was called to order by President Findeisen, Green Bay, with C. A. Peck of Berlin in his usual place as secretary. The address of welcome to Milwaukee was made by Alvin P. Kletzsch, president of the Citizens' Business League of that city, to which Mr. Findeisen appropriately responded. Mr. Findeisen followed with his annual presidential address, which is given herewith. Mr. Peck then presented his reports as secretary and treasurer, which are summarized below. We are also permitted to give the paper read by E. K. Cunningham of Berlin, entitled "The Retail Hardware Store."

PRESIDENT FINDEISEN'S ADDRESS.

It gives me great pleasure to greet you at this meeting. We are meeting here for the eighth time to carry out the principles for which this organization stands, and I am pleased to see so many familiar faces, as well as some new ones that have never met with us before. I trust that each and every one of you may become so interested and derive such benefits from this meeting that he may feel that it was well he attended, and will look with pleasure to attending these meetings in the future.

Our association is in a most flourishing condition. We have at present a membership of 300, and a nice, round sum in our treasury. That our finances are in such excellent condition we are indebted to our worthy secretary, for it is largely through his able management in securing advertisers for our programme that our treasury is enriched from year to year.

The National Association, with which we are affiliated, is doing very excellent work through its efficient secretary, and any one that reads the "National Bulletin" can see that it is already a power for good. I think we took

a step in the right direction when we joined the association.

The year just closed has shown unusual prosperity in all industrial lines, and I trust that you have met with abundant success in your business, and that, after taking your inventory, you found the balance on the right side of your ledger. While the business barometer for the year just begun does not indicate anything unusual, no valid reasons can be given so far why it should not be as good, or even better, than the one just closed.

MUTUAL INSURANCE.

At last year's meeting you appointed a committee of three, consisting of your president, ex-president and secretary, to ascertain the steps necessary to form a Mutual Retail Hardware Insurance Company. That committee met, and instructed your secretary to engage an attorney well versed in insurance matters to assist him. With his accustomed energy, your secretary proceeded at once to Madison, and succeeded in having the Legislature, then in session, pass an act under which we could organize. It will be necessary for you at this meeting to appoint a Board of Directors, such as can and will serve; but as we expect a paper on this subject in which everything will be discussed fully, I will refrain from making any further comment.

MEMBERSHIP.

Another matter that deserves your careful attention is how to increase your membership. There are about 1000 retail Hardware dealers in this State, and of these about 300 belong to our State association. I hope you can devise some plan by which this desirable object can be attained. Some five years ago you succeeded in interesting the traveling men in our cause, and I understand that through their efforts our membership was increased very materially. Then why not adopt this plan for 1904? The boys on the road are our friends, and our secretary could furnish them with a list of our membership, together with a circular setting forth the benefits, not overlooking the insurance feature, that would be derived by joining our association. I have no doubt that if this plan were followed with energy we should increase our membership 50 per cent. in one year. But every laborer is worthy of his hire, and I would suggest that a commission be paid for every member thus secured.

PARCELS POST.

Secretary Corey of the National Retail Hardware Association makes a strong appeal to every member of this association in the last number of the "National Bulletin," requesting you to write your Congressman and to enter your protest against the passage of the measure now before Congress, known as the Parcels Post bill. Will you do it? This is a catalogue house measure, pure and simple, and it is the duty of every member of this and kindred associations to do everything in his power to defeat this infamous bill. I express the hope, therefore, that you will not let this appeal go unheeded, but will write your Congressman to work and vote against the measure.

There are undoubtedly a number of questions that ought to receive our attention at this meeting, and that may have escaped my notice; in that case I hope that each and every one of you will be free to mention anything that may be of benefit to the members of this association. It has been my pleasure to attend three meetings of this association previous to this one, and I am free to say, without fear of contradiction, that the last one was always more interesting and more beneficial than its predecessor, and I venture the hope that this one will be no exception to the rule. In conclusion, I will say that one thing I have always found at every meeting I attended ,and which pleased me as much as anything, and that is the kindly and tolerant spirit that prevailed in all of our discussions and transactions, and I venture the hope that the same conditions will prevail at this meeting. That the benefits derived from this, our eighth association meeting, may be commensurate with the time and money expended, and assist us in solving the problems that may confront us in 1904, is my sincere wish.

SECRETARY PECK'S REPORT.

C. A. Peck, Berlin, secretary of the association, reported that at the last meeting of the organization 193 members paid their dues for 1903, and 37 new names were added to the membership. During the year about 80 members paid their dues, and 10 were dropped for nonpayment, so that the present membership is about 300. The Executive Committee met twice during the year, May 27 and November 23, on both occasions at Oshkosh. The insurance feature of the association work was nearly ready for launching early in September, when the secretary was taken ill and for a period of four months was unable to give it or other association matters much attention. On July 23 a circular was sent out requesting members to give information as to prices at which they were selling certain designated goods, with a view to ascertaining how these prices compared with those made by catalogue houses on the same goods, the manufacturers of which claimed that the merchants were selling as low as the catalogue houses. The replies showed that to a great extent these goods had been dropped for catalogue houses to handle exclusively. Mr. Peck also referred to the Parcels Post bill and to the efforts made to stir up

C. A. PECK.

merchants to a realization of the dangerous character of the provisions of the bill, and the necessity of stirring up their representatives in Congress in opposition to it.

TREASURER'S REPORT.

Mr. Peck's report as treasurer showed that the association was in a very flourishing condition. In February of last year the balance on hand was $1348.14, while the balance this year is in excess of $1500.

THE RETAIL HARDWARE STORE.

BY E. K. CUNNINGHAM, BERLIN, WIS.

We consider the location an important feature of the Hardware business, a corner store being preferable for many reasons. Goods can be loaded and unloaded at the back and side entrances, thus saving litter and trucking through the store on busy days. It affords a better light, also enables one to handle Stoves and heavy goods much easier in loading, and keeps the front of the store neat and clean and ever ready for business.

TO MAKE THE FIRST IMPRESSION FAVORABLE,

the store front should present a neat appearance. We keep ours all painted, with a fresh coat of paint each season; the cost is trifling and aids much to make an attractive store. We believe in making our store known to the public. We use for our mascot the owl, having two large bronze colored owls painted on our front windows,

under which is printed, "The Owl Store; We Never Sleep." We use this in connection with all our advertising and on our stationery. We also have a small owl sticker in the form of a trade-mark which we paste on every article in our store, and on every package that goes out, thus keeping our store constantly before the public.

We all laugh at the boy who went to market with a sack of potatoes and did not sell any, as he kept them in the sack, and to the only man who asked what he had in the sack, he replied: "None of your business." However, many of us fail to grasp the close relation existing between publicity and success. The goods that are seen are the goods that are bought. A dealer may have the finest goods in the world, but no one will know it if he keeps them in the original packages in the corner of the cellar. People buy what they see, and it should be borne in mind that many people in this country have an imperfect knowledge of our language, and perhaps do not know the English word to describe what they want, and embarrassment in filling their wants is avoided when

E. K. CUNNINGHAM.

goods are plainly shown. This then leads up to the question of show windows, store arrangement and advertising.

SHOW WINDOWS.

Window displays are but samples of a well arranged store. It is not every clerk or Hardwareman who can fit up an attractive show window. Original ideas are the best in every way. Have in mind just what you want before starting out to make a display. Stepping stones to success lie in the foundation and beginning. So it is in window trimming. "Well begun is half done." There must be method in this, as in all things in which there would be success. Displays should be changed every week at least, and when once in running order do not fail to keep them up. Enough time is not generally spent on window displays. Do not give passersby an opportunity to criticise in any way. Spare time cannot be used more advantageously than in trimming up windows and in keeping them attractive. New goods should be put on display as soon as possible. Show them to the public—they are the buyers. Increase in sales is invariably noticed, and many times new customers are gained through attractive show windows. Keep your windows perfectly clean at all times, as no display, however neatly arranged, can attract attention unless the window glass is perfectly clean. Make your displays as different as possible from those of your competitors. Work out ideas in window displays of your own. A wideawake, hustling, up to date merchant never allows his window displays to look old and stale, and this also should apply to the stock in general.

ADVERTISING.

In regard to advertising, we consider the newspaper the best medium through which to reach the public, especially among the farmers, as the farmer of to-day receives his daily and weekly newspaper through rural routes as regularly as do those of us in the cities and towns. Local advertisements should be worked in unison with the window displays. Many customers are attracted to the store through the medium of local advertisement. People who do not get downtown every day are kept in touch with your new goods and displays through the paper, and, if interested, they will come down to see the exhibit before the change is made.

In relation to your business, what are your ads? You are in business to make money. In order to do this you have to buy goods, have to sell goods, and the latter is your chief aim. Your reputation for fairness and square dealing helps you in this, as does also your friendship and position in the community. Your clerks are important associates and add to your success. Your stock and store and the way your goods are displayed aid you. These are some of the ways of selling goods. One can have the finest newspaper ads. imaginable, and their effect as business getters may be completely nullified by your poor store keeping, lack of attention on the part of clerks, poor goods, lack of consistency on your part, or any other item of bad management. They used to say "Honesty is the best policy," but that was years ago. Nowadays honesty is the only safe policy to tie to, and a merchant's ad., unless the honest representative of an honest business, had better be unpublished, for it will react with the deadly effect of a boomerang; but an ad. that sells well is a good one. Let us examine its character.

IT'S YOUR AD.

I have in mind a man who has been successful in advertising, but whose ads. are as ungrammatical as is his every day speech. But they are his ads. If they were written in the king's best English they wouldn't be his ads. So I am of the opinion that if you are in the habit of using such an expression as "We've got 'em at the Owl Store," it is better in your ad. than to allow the printer to change it to the unnatural, the more grammatical and elegant expression, "What we lack in quantity we make up in the supreme excellence of our quality." Yes, its better to be grammatical, but don't send out from the printing office an ad. that wouldn't feel at home in your store. The great weakness of men is to write as they never speak. That's poor stuff to put into an ad. Your ad. should be your own talk spread out on paper. Practice writing your ads. as you would talk, though ungrammatical they be; then they will be more a part of yourself, and, in my humble opinion, will better serve the purpose for which they are intended and assist you in selling your goods. Such ads. are the only successful ones. If some men talked as they wrote they would soon be sent to the place where the State takes care of people not possessed of all their faculties. The main thing is, then, it's your ad. and should represent you.

STORE ARRANGEMENT.

The interior of the store should be kept as neat and clean as the show windows. That Hardwaremen are noted for their enterprise and intelligence is a fact generally recognized, and for this reason it seems strange that so many of them are negligent in matters pertaining to the arrangement and cleanliness of their store rooms. A great many of them who have scrupulously clean, neat and tidy houses, and who would be quick to find fault with the good housewife on account of any breach on her part of the laws of cleanliness and neatness therein, will permit their offices and store rooms, in which they probably spend more of their time, to become so untidy and unclean as to cast reflections on the entire craft. The fact is the old proverbs, "Cleanliness is next to Godliness," and, "Order is Heaven's first law," are as applicable to the Hardwareman as to his fellow merchant in any other line of business. That it is possible to have a Hardware store almost, if not quite, as attractive as that of the clothier, dry goods man, or even the jeweler, may

be demonstrated by a visit to one of the modern, up to date stores, such as are becoming quite common in most localities.

WE USE AS MANY SHOWCASES AS POSSIBLE.

Keep them clean and neatly arranged, using one for Cutlery exclusively, another for Nickel Ware and Silver, and so on, with the goods properly arranged in each. Our shelving we extend from the floor to the ceiling on either side, using traveling ladders. On one side we keep Hardware, Sporting Goods, Builders' Supplies, Tools, &c. On the other side we arrange Paints, Varnishes, Granite and Tinware, Wooden Ware, &c. For Hinges, Clevices, Malleables, Nuts and Washers, we have small cabinets neatly arranged in the rear of the store on our Bolt counters. Our Wire Screen we have on a stand or rack by itself, with room for full rolls underneath. Window Glass in a case, with cutting board at the end. Hoes, Rakes, Forks, Shovels, Spades on brackets, with Handles in a rack underneath. Hay Knives, handled Axes, Crowbars, Log and Cattle Chains of all kinds we keep in racks. Washing Machines, Churns, Wringers and this class of goods are kept neatly arranged along the side of the bolt counters. Now, in regard to the

ARRANGEMENT OF STOVES AND RANGES.

I take great pride in this branch of our business. Our Ranges and Cooks we keep nearest the shelving. Have them neatly polished and set in a perfectly straight row, ranging in size and price to suit the trade. A customer comes to your store to buy a Range. You show him a well assorted line of from 15 to 20 Stoves and Ranges, ranging in price all the way from $25 to $60, and you stand a much better show to make a sale than if you had a few Ranges, poorly polished and set in a zigzag manner around the store.

We have our Heaters displayed in the center of the store, finely polished, and set up on steel frame castors, with the nickel neatly polished. It is truly said, "A stove well blacked is half sold." We use black silk polish on all our new goods, as it costs but little more and gives a Stove a much finer appearance. We arrange our Coal Stoves in the front and continue down the line with the Surface Burners, Parlor Stoves, Wood Base Burners, Oaks and Air Tights, having one sample of each style and size always on the floor in Stove season. A great many times you can sell from stock and retain samples on the floor.

SECOND-HAND STOVES.

We also find the second-hand Stove business a very profitable one. We buy and trade second-hand Stoves of all kinds. This branch of our business is kept entirely separate, having a room fitted up for the purpose. These goods oftentimes net us more clean money than new goods. A man comes to us in the early fall to trade Stoves. We trade him a new Stove, getting our price, and get the old one at a very low figure. This Stove is then taken into the second-hand room and the necessary repairs made thereon, after which it is polished and placed on the sale floor, and oftentimes brings a better margin of profit than new goods. We have found this very successful, having sold as high as 100 good second-hand Stoves in a single season.

FURNACES.

The Furnace question is becoming an important feature in connection with the retail Hardware business. How many of you to-day are doing your Furnace work right? How many of you are making money on the Furnace business? How many are getting satisfactory results? We, having been in the Furnace business for a number of years, have learned some of the drawbacks as well as some of the good points in connection with it. Too many Hardware merchants to-day are doing their work on a guessing plan. Too much trouble results after the Furnace is installed. I think if we all could confine ourselves to figures, measuring every foot of pipe and material that goes into the construction of a Furnace job, and estimate more closely on time and labor, be more careful in buying a good Furnace, having it set as neatly as possible under the center of building, use a larger size of piping and cold air returns than is commonly used, much better results in Furnace heating would be attained, and the dealer would reap a better harvest and the customer be more satisfied.

GOOD BUYING IS AN ESSENTIAL REQUISITE

of every business. Unless goods are well bought there can be no permanent success in trade. The most skilful management of all other departments of a business cannot counteract the effect of careless and injudicious buying. "Goods well bought are half sold," is eminently true. A successful buyer must have a thorough knowledge of the goods he buys, to be able to determine whether goods offered him will warrant him in purchasing. Should the buyer's knowledge of goods be deficient, the seller will not be slow in detecting it, and will take advantage of his ignorance by selling him goods that an expert Hardware man would not buy. The office of buyer is an important one and should not be intrusted to a novice in business. If it is, it will prove a very costly experiment to the firm. The buyer should frequently consult the want book to see what goods are getting short. This book should not be used, however, to make an order from, nor should every article on the want book be ordered as a matter of course. He should consider the entries merely as reminders that certain goods are getting low. If there are on the want book narrow wrought butts, 3 inches, he should not order two dozen narrow wrought butts, 3 inches, but should look over the stock of wrought butts and similar goods and sort up the whole line, provided there are enough wanted to make an order.

The buyer should be polite, listen to what the seller has to say, note his prices, &c. Let the seller do most of the talking and keep your own business to yourself. Do not give away prices made by other houses, nor seem too eager to buy in case low prices are quoted. The seller thus having no pointer, and knowing the buyer to be well posted, will be more apt to give the lowest prices than if he had been permitted to feel his way. If no goods are wanted at the time, the seller should be informed to that effect in a courteous manner. If the seller offers a bait in the way of extremely low prices, take him up, but do not allow him to make good by charging you more for other goods. Everything being equal, give houses the preference whose goods are the best and come in the best shape; fill orders promptly, and always be willing to correct errors if they occur. There are no more critical judges of human nature, and none who can more readily size up a man, than commercial travelers, and their esteem and respect are to be desired if one would buy goods to the best advantage.

EMPLOY GOOD HELP,

treat them well, take pains to post them about your lines, give them the management and care of certain lines, and hold them responsible for the success of their department. But don't expect too much from clerks. Don't expect that they will not make mistakes. They certainly will; all men do. When they make mistakes don't forget all their good qualities; these very often more than offset the other. An employer should never lose control of his temper. As soon as he does he loses the mastery of the situation. Dissatisfied clerks will appear in every business, and when this happens there are only two things to do. Satisfy them or let them go. It never pays a clerk to stay after he becomes dissatisfied—much less does it pay his employer. An employer should always manifest a personal interest in the private lives of his employees. It seems to bind together the interests of the employer and employees. An employer who can command both the love and respect of his clerks can always get better service, more of it, and at less cost, than one who fails in this respect.

We have come here both for business and pleasure, and I feel quite sure that we will all be greatly benefited by our attendance at this convention. Life, from boyhood to the grave, is, to the ambitious and energetic, an ever changing and intricate problem, full of possibilities and responsibilities that make up put forth our utmost efforts to attain that ever fleeting and, after all, only relative object, success. One of the elements of success in the life of every business man is the acquiring of a competency out of his business sufficient to enable

him to spend the declining years of his life in ease, comfort and happiness. His object is not merely to eke out a scanty subsistence, but to store up a little reserve for a sore foot, a rainy day, and for the night when no man can work. And, gentlemen of this association, if this paper will contribute in a measure, however slight it may be, to the realization of this success for which we are all striving, and which we some day hope to attain, I shall feel amply rewarded for the time and labor spent in its preparation.

KEEPING TRACK OF PRICE-LISTS.

JOHN E. BASSETT & CO. of New Haven, Conn., Hardware dealers, are using a simple system of their own design for keeping track of price-lists. The system was designed by their Geo. J. Bassett, and is worked to excellent advantage. By its use price-lists of any line of goods are quickly available in meeting the wishes of customers or by the firm when it is necessary to replenish depleted lines of stock or to add new lines. Primarily there is a General Index Book in which are two indexes.

The First Index

is tabbed simply A, B, C, D, &c., the names of houses whose prices are indexed being placed each under its initial letter, and each name is numbered. Against each name is also one of the following letters:

B, P, S, C or I.

These letters indicate the location of the price-list. The larger lists, in pamphlet form, are stored in boxes, the letter B in the index indicating this. The boxes are lettered on the front, a box to each one of the more frequently used letters; and several letters to a box in such a case as X, Y and Z. The lists are arranged alphabetically in the boxes.

The Price-List Book,

indicated by the letter P, is a large volume, in which price-lists are pasted on sheets, which may be conveniently cared for in this manner. The letter S stands for Shelf, upon which large catalogues, library fashion, such as are issued by the large Hardware manufacturers and jobbers, are placed, library fashion.

The Letter C

represents a Card File, used for the few concerns who issue price-lists in card form. The letter I stands for the invoice book, an important feature of the system. The location of lists in the

Price-List Book

is designated by entering the number of the page opposite the name of the company in the first index. Where prices indexed are in the invoice book, the number of the volume is given after the letter I. John E. Bassett & Co. preserve all their invoices pasted in large volumes, each volume fully indexed, and have this record for a dozen years or more back.

Taking a sample letter in the first section of the General Index, we find something like this:

Samson Cordage Works.....1—B
Sargent & Co.....2—S
Scoville Mfg. Company.....3—P49
Simonds Mfg. Company.....4—B
Smith & Co.....5—116
P. & F. Corbin.....1—S
Coes Wrench Company.....2—B
Capewell Horse Nail Company.....3—B

The second section of the index is used for names of goods, and is indexed to the first two letters, as

Ba, Be, Cr, Etc.

Opposite each article of merchandise classified—and the number of such is very large—is the alphabetical letter and number of every concern manufacturing or dealing in this special line of goods, whose name appears in the General Index. For instance, if the firm wish to get prices on Tacks, Ta is turned to, and they have:

Tacks, G 21, M 47, P 12, R 79, S 30.

Referring to the first section, they find G 21 is the Grand Crossing Tack Company, M 47 the Milwaukee Tack Company, P 12 the Plymouth Mills, R 79 Ripley & Bartlett and S 30 the Shelton Tack Company. Against each of these names is found the letter indicating the place where the desired price-list may be found. It will be readily understood that little time is lost in bringing to hand every price-list on this or any other line of merchandise.

The references to

The Invoice Book

are sometimes peculiarly useful. Many of the smaller concerns issue no lists, and in such instances the invoices give a pretty good line on what may be expected in the way of present prices, even though an invoice be a year or two old. For example, they had a request from a customer for prices on showcase Trays, which was an unusual demand. The second section of the index had showcase Trays indexed with a reference to a concern in the first section, which, in turn, referred to the invoice book of a certain number. The firm had bought showcase Trays perhaps two years ago, and consequently under their system they had the matter of prices ready at hand. A similar instance occurred where a customer wanted Fire Place Bellows.

BENJAMIN S. ALDER.

BENJAMIN S. ALDER, 37 Warren street, New York, in addition to the manufacturers whom he has been representing, has been appointed New York City and export representative of the following concerns:

Champion Blower & Forge Company, Forges, Blowers, Post Drills, Tire Benders, Champion Electric and Easy Screw Plates.
Moline Malleable Iron Company, Malleable Iron Link Chain Belting.
Oshkosh Logging Tool Company, Logging, Driving and Telegraph Construction Tools.
J. B. Foote Foundry Company, Church, School and Farm Bells, Saw Vises and other Hardware Specialties.
Allegheny Forging Company, Bolts, Nuts, Washers, Coil Chain.

In addition to the above, Mr. Alder continues as representative of the following houses, thus making his line cover, it will be seen, a large variety of leading goods made by representative manufacturers:

Wrightsville Hardware Company, Cast Iron Hardware.
E. T. Fraim (Keystone Lock Works), Padlocks, Latches.
Bemis & Call Hardware & Tool Company, Wrenches, Combination, Nut, Pipe, Adjustable "S."
Oswego Tool Company, Pipe Cutters, Vises, Tube Expanders, &c.
Moline Malleable Iron Company, Link Chain and Belting.
Warren Axe & Tool Company, Axes, all kinds.
Knapp & Cowles Mfg. Company, Screw Drivers, Mincing Knives, &c.
Hollinger Fence Company, Shovels and Spring Cotters.
Williamsport Iron & Nail Company, Cut Nails.
Detroit Register Company, Mrs. Potts' Sad Irons.
Advance Mfg. Company, Stove Pipe Thimbles.
C. E. Jennings & Co. (export only), Carpenters' Tools.

The entire store, basement and cellar at 37 Warren street, New York, have been rented by Mr. Alder, who will, for the convenience of the local trade, carry a stock of the goods of the following manufacturers: E. T. Fraim (Keystone Lock Works), Bemis & Call Hardware & Tool Company, Oswego Tool Company, Champion Blower & Forge Company, J. B. Foote Foundry Company, Moline Malleable Iron Company. In Mr. Alder's sample room a complete line of the goods made by the various manufacturers represented by him are displayed. In this increase in Mr. Alder's business the trade will find an indication both of the importance of the city and export trade centering in New York, and also of the success with which Mr. Alder serves those whom he represents.

The style of the Hardware firm of C. A. Booth's Son & Co., Vergennes, Vt., has been changed by mutual consent to J. A. Harrington & Co. The partnership interest will remain the same. This is one of the oldest Hardware houses in Vermont, having been established in 1848 by W. R. Bixby & Son.

G. C. Stephens, Brooklyn, Wis., has disposed of his Hardware, Stove, Paint and Sporting Goods business to G. W. Forbes, formerly of Adell, Wis.

ORGANIZATION AND THE SALE OF AGRICULTURAL IMPLEMENTS AND VEHICLES.

AN address by F. E. Myers, president of the National Association of Agricultural Implement and Vehicle Manufacturers, at the recent annual meeting in Kansas City, Mo., of the National Federation of Implement and Vehicle Dealers:

An event of far reaching importance to this broad, fertile and beautiful country was the advent of the pioneer farmer. Less than 50 years ago this vast and exceedingly rich domain was uninteresting and valueless because it was unpopulated. We dealers and manufacturers, as well as the citizens of this splendid, cosmopolitan city in which we assemble, are indebted to the pioneers, who left home and friends to seek their fortunes amid the perils and hardships of frontier life, and this is a fitting time and place to acknowledge this debt of gratitude for the prosperity and comforts we now enjoy.

The members of this association are the legitimate successors of the pioneer, whose Breaking Plow, Cultivator, Planter, Wagon, &c., aided in the development of this country. His requirements interested and stimulated the manufacturer to bring out Implements adapted for the needs of the pioneer, proving again the truth of that trite saying, "Necessity is the mother of invention." This gathering of earnest, energetic and enthusiastic men represents a business of large interests and great importance. The retailers of Agricultural Implements and Vehicles constitute an important factor in the world of commerce, and they are well represented in this association.

I am a firm believer in organization; in associations of business men for the purpose of bettering their condition. It is right that you should have your organizations. It is right that you should be protected by manufacturers and jobbers, and be able to protect yourselves against illegitimate competition; against competition with those from whom you have to buy, and against every class of men who are a discredit to any branch of business.

LEGITIMATE GAIN IS THE BASIS OF ALL COMMERCIAL TRANSACTIONS,

and the sale of Agricultural Implements, Vehicles and kindred goods at prices which do not yield a reasonable margin of profit is contrary to sound business principles. The dealers in Implements in every town should maintain harmonious relations and stand together to resist all influences which tend to rob them of the legitimate fruits of their labor. The organization of the various retail Implement and Vehicle associations has brought about a notable improvement in the character of those engaged in the business. The new dealer must compete with men of standing and responsibility in the community and must necessarily be prepared to meet conditions on an equal footing with them. If he fails to do this his mission is at an end. The public, after a short experience, will have no more of him, and the manufacturer, who is now in more direct touch through the medium of your associations, will not take the risk of encouragement. As a manufacturer I fully appreciate that the improved condition brought about by your organizations has been of great benefit to the trade at large. Your opinions represent the consensus of many sound minds and have an influential effect on everything pertaining to the betterment of the Implement and Vehicle trade. Your credit and general responsibility are strengthened and invite the hearty co-operation of all manufacturers and jobbers.

The Association of Agricultural Implement and Vehicle Manufacturers, of which I have the honor to be president, stands for a large part of the world's requirements of Implements and Vehicles. Our association has placed itself on record as being in sympathy with the aims and objects of your organization, and as an association it is pledged to aid you in the effort to prevent legislation detrimental to your interests and to co-operate with you in every effort to promote the interests of the Implement and Vehicle trade.

THE INTERESTS OF THE MANUFACTURER AND DEALER ARE MUTUAL.

Your success means our success. Our interests are so closely interrelated that we should assume the same attitude toward the customs, laws and regulations that have a bearing upon the trade of either branch of business. Recognizing these truths, the National Association of Agricultural Implement and Vehicle Manufacturers have recorded its opposition to the proposed domestic Parcels Post because your associations have shown that the adoption of this system by the Federal Government would work incalculable injury to the retail trade. As president of the association, I have solicited the commercial agencies, both Dun and Bradstreet, at the suggestion of the Dealers' Federation, to adopt a uniform and correct classification of the dealers in Implements and Vehicles, believing this would be a direct benefit to both dealer and manufacturer.

The members of our association recognize their dependence on the retail dealer, and that his prosperity reverts to the benefit of the manufacturer, and the association, through its various committees, is earnestly working to place your business on a higher and more profitable plane.

CORRECT BUSINESS METHODS.

The manufacturer has undoubtedly been more successful than the dealer, because of better business methods. There is no legitimate reason why dealers in Implements should not be as successful as the manufacturer or merchant in other lines, if proper business methods are adopted. The manufacturer who is successful watches closely every avenue of his business, making little economies here and there, reducing the cost of production to the lowest possible point consistent with the use of first-class material and proper finish of his goods.

You understand my prime business is that of a manufacturer. I had the good fortune to be bred a farmer boy in the good old State of Ohio, the State which so many Kansans claim as their birthplace. Later I became a distributer of Implements in a large way, so that you cannot help but feel that I have something in common with you. The base of our present manufacturing business was made in the distributing of Implements. In my judgment,

THE DEALER WHO BUYS EARLY AND DIRECT FROM THE FACTORY,

and in quantity, the best goods for the purpose, and then makes a corresponding effort to market them, will be the most successful. The dealer is supposed to understand the merits of the respective lines he handles better than his customers. Investigation of merit, without prejudice, and the securing of exclusive agency, if possible, so that he can recommend the goods to the consumer, unconditionally, and stand behind them, are additional points for consideration.

Trade is secured to a large extent, as bank accounts and credit, through confidence. The recommending of different makes of Implements for identically the same pupose is, in my judgment, a great mistake. Farmers exchange opinions and experiences. When one buys a machine and they find the dealer is recommending another machine to induce them to buy, they question his sincerity, a condition he cannot afford to have arise. The best plan is to

SECURE THE AGENCY FOR THE BEST MACHINE MADE

for the purpose in quantity and for the exclusive agency, and then stand behind it and talk it enthusiastically, as the dealer can under those conditions. The time has come when the farmer must adopt modern methods for rapid work, the same as manufacturers, and when he is entitled to the best Implements money, inventive genius and experience can produce, and proper enlightenment on the part of the dealer to the extent of placing in his hands machinery of the greatest capacity and best adapted for his requirements. With this consideration, and those other prime essentials of good business, a uniform price, regardless of what others do, and settlement on delivery, the retail Implement business should prove profitable and satisfactory.

I cherish the memory of my own experience as a dealer in Implements, and the many lasting friendships then formed. The art of making friends is one of the dealer's most valuable assets. Having formed these friendships, then, "To thine own self be true, and it must follow, as the night the day, thou canst not then be false to any man." Gentlemen, I thank you for your attention.

FACTORY COST AND BUSINESS METHODS.

FACTORY AND OFFICE SYSTEM OF ATLAS MFG. COMPANY, NEW HAVEN.

This article finishes the description of the Factory System as described in their Scheme Book. The next installment will tell of the rules for the Stock Department, with its several divisions.

PART V.

SCRAP AND ITS DISPOSITION.—Page 54.

SEC. 27. The scrap[37] made in each lot is to be bundled, strung, or packed in some compact form. Each Package is tagged,[38] marked with the number of the lot and the person making it and the number of the

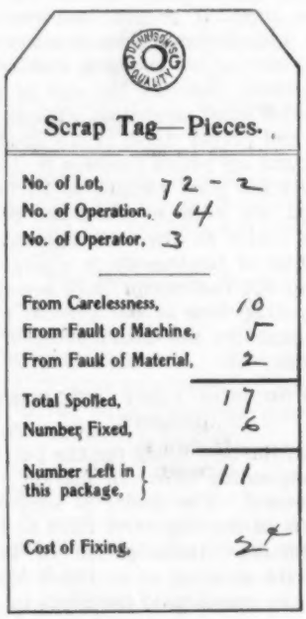

Scrap Tag—Pieces.
No. of Lot, 72 - 2
No. of Operation, 64
No. of Operator, 3
From Carelessness, 10
From Fault of Machine, √
From Fault of Material, 2
Total Spoiled, 17
Number Fixed, 6
Number Left in this package, 11
Cost of Fixing, 3¢

Fig. 23.—The Scrap Tag.

operation at which it was made. (In the case of scrap that is discovered after the lots have been mixed up in the finishing and packing departments, the number of the lot cannot, of course, be given.)

SEC. 28. It is then inspected; such pieces as can be are fixed and put with lot No. 1; those that cannot be fixed (irredeemable scrap) are rebundled and retagged, the same tag being used. There are then entered on the tag the following items:

Number of pieces of scrap made through carelessness.

Number of pieces of scrap made through defective machinery.

Number of pieces of scrap made through defective material.

Total number of pieces of scrap

Number of pieces fixed.

Net amount of irredeemable scrap in package.

Cost of fixing.

SEC. 29. All these items are to be placed upon the ticket of the person making the scrap, as provided in Page 52, Sec. 20, and then these packages of irredeemable scrap are to be placed near to lot No. 1; there to remain until the run is completed, and the figures made up and compared.

[37] As has been stated before, scrap is a very important item in this factory, and it is found that special efforts must be expended to prevent its being made.

[38] A scrap tag measuring 2⅝ x 5¼ reproduced, as Fig. 23.

SEC. 30. The superintendent is then to inspect the scrap thus accumulated and give instructions for its disposition. No scrap is to be disposed of without the instruction of the superintendent, and no scrap is to be disposed of which is not bundled, or packaged, and tagged. This does not apply to "Waste" and "Tare."

WASTE AND TARE.

S53. 31. No account is to be kept of "Waste."[39] The "Material furnished" covers waste and number of good pieces required.

SEC. 32. The "Tare"[40] in each run is to be put by

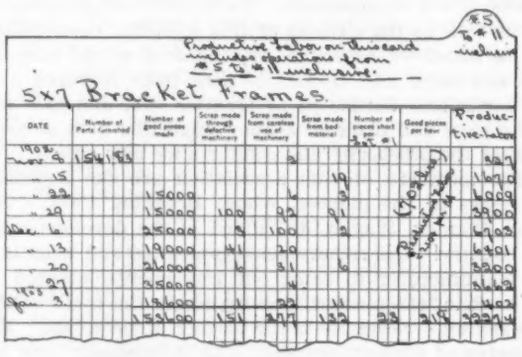


Fig. 24.—The Run Card, Giving Particulars of Weekly Production and Labor Costs.

itself in a box *near* Lot No. 1, weighed up at the end of the run, and entered on the "Completed order" previous to handling same to the office as provided in Page 52, Sec. 25.

REPORTS AND RECORDS.—Page 54.

THE RUN CARD.

SEC. 33. The items on the weekly time tickets are transferred each week to another card called the "run card."[41] On this card they are classified and put into

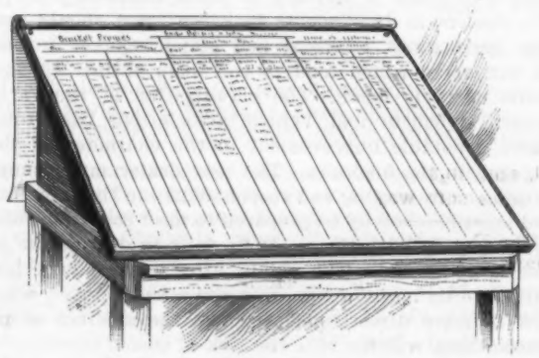


Fig. 25.—The Daily Record of Production.

shape for easy comparison and permanent record. A separate "run card" is provided for each article and each part of the article.

[39] The terms of waste and scrap as used in this factory should not be confounded. Waste consists of that part of the material that cannot be expected to be made into the finished article. Thus, it is that part of a sheet of steel that is left after the blanks have been punched out. Waste is necessary, while scrap is avoidable, and is caused by carelessness of the operator or by defective machinery or material.

[40] Tare is used in its ordinary sense, meaning the wrapper, binder, container, &c., for the material.

[41] A part of one of the run cars, which measure 5½ x 8 inches, is reproduced in Fig. 24. This shows the method of tabulating the record each week and finding the total of a number of runs with the average cost of productive labor per thousand pieces worked on. These run cards are kept as a card index in a file box.

THE DAILY RECORD.

SEC. 34. A report is handed to the office early each morning of the output of the day previous at the finishing operation of each order being worked on, also of any other operations that may be asked for.

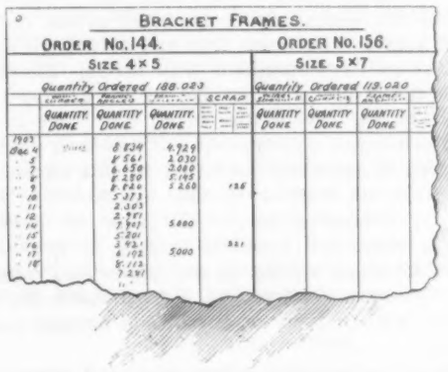
SEC. 35. Also there is to be entered upon this "daily record"[42] once a week the amount of scrap and quantity fixed as shown on the run card and weekly time tickets. (The record on the "run card" is taken from the time tickets which state quantity turned out in a week in full lots. The "daily record" shows quantity turned out each day regardless of lots, but the two records should tally in the aggregate.)

RULES.—Page 58a.

SEC. 1. Smoking is not allowed in the factory.

SEC. 2. Habitual eating, chewing or spitting is not allowed.

SEC. 3. Loud singing, whistling, or other disturbances not allowed. Talking on matters not pertaining to the work and general conversation are not expected.


BRACKET FRAMES.

ORDER No. 144. SIZE 4×5				ORDER No. 156. SIZE 5×7			
Quantity Ordered 188.023				Quantity Ordered 119.020			
QUANTITY DONE.	QUANTITY DONE.	QUANTITY DONE.	SCRAP	QUANTITY DONE.	QUANTITY DONE.	QUANTITY DONE.	
1903							
Dec 4	8 839	4.929					
" 5	4 561	2.030					
" 7	6 650	3.080					
" 8	4 250	5.195					
" 9	8 626	5 260	126				
" 10	5 373						
" 11	2 303						
" 12	2 747						
" 14	7 907	5.800					
" 15	5 201						
" 16	3 923		321				
" 17	6 102	5000					
" 18	8 112						
	7 297						
	"						

Fig. 26.—A Section of the Daily Record Shown in Fig. 25.

SEC. 4. The help are not allowed to run belts on or off without *special* permission.

SEC. 5. The floor around each machine is to be picked up each night and left free from any litter.

SEC. 6. Fifteen minutes or earlier if necessary, before closing time each Saturday, work is to be stopped and each machine that has been in use is to be wiped up and cleaned.

SEC. 7. During working hours the office entrance is to be used by the help in entering or leaving the building.

SEC. 8. All oily waste is to be kept in the cans provided, and rags and other combustible material disposed of in some safe way.

[42] The Daily Record is kept of all the standard goods regularly made, and shows the number of each for each kind and size that has been finished in each of the principal operations. This record is kept in the office, as shown in Fig. 25. A portion of this record has been reproduced in Fig. 26.

(To be continued.)

THE THOMSON-DIGGS COMPANY'S CATALOGUE.

THE THOMSON-DIGGS COMPANY, Sacramento, Cal., issue catalogue No. 10, containing 992 pages, devoted to general Hardware, Iron, Steel, Sporting Goods, Cutlery, Vehicles and Farm Implements. The goods are arranged in seven departments as follows: Mechanics' and Miscellaneous Tools; Farming Tools and Implements; Builders', Cabinet and Shelf Hardware; Miscellaneous Hardware and House Furnishing Goods; Blacksmiths' Supplies, Wagon Materials, Iron, Steel and Metals; Belting, Packing and Pipe Fittings, Brass Goods, &c.; Guns, Ammunition, Sporting Goods and Sundries; Pocket and Table Cutlery, Silver Plated Ware. In addition to the department index there is an alphabetically arranged index covering 40 pages. It has been the aim to classify, illustrate and describe all goods carried in stock in a plain compact form. The book is fully illustrated, printed on a good quality of paper, and conveniently arranged for reference. The company are to be complimented on the production of such a complete work, which will, no doubt, be highly appreciated by their customers, the number of whom is steadily growing.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers issuing new catalogues or price-lists are requested to send to THE IRON AGE *two copies—one for the Catalogue Department in the New York Office, and one for the Iron Age Library of Trade Literature in London.*

WESTERN WIRE GOODS COMPANY, Buffalo, N. Y.: Catalogue No. 1, illustrating Bright Wire Goods, Coat and Hat Hooks, Molding Hooks, Jack Chain, Spooled Wire, Wire Picture Cord, Double Pointed Tacks, Staples, Fly Killers, Garment Hangers, Sink Drainers, Toasters, Culinary Baskets, Egg Beaters, Wire Toilet Articles, Towel Brackets and Bars, Wire Kitchen Articles, &c. Wire is straightened, cut, bent, milled, threaded and made to any special shape, to order.

WALTER B. STEVENS & SON, 114 Chambers street, New York, and Philadelphia: Illustrated catalogue and price-list No. 9 of Dog Furnishings, made by them. In the 64 pages are shown many new styles of Dog Collars and other furnishings, 51 pages being devoted to Collars alone. There are also Dog Harness, Blankets, Bells, Padlocks, Leads, Whips, Muzzles, Combs, Brushes, Couplings and Whistles for dogs and cats in complete assortments.

THE DAYLIGHT ACETYLENE GAS COMPANY, 126 Second street, Louisville, Ky.: A 147-page catalogue devoted to the Daylight Automatic Acetylene Gas Generator. This Generator is one of the type that has the carbide distributed in small charges in a compartment pan, so that as one charge of carbide ceases to produce gas, the water overflows to the next compartment, and so on until all of the carbide has been spent.

THE NIKSAH SNOW GUARD COMPANY, 26 Alaska street, Boston, Mass.: Folder in the interest of the Niksah Snow Guards. The Guards are applicable to all slate and shingle roofs and are made in two styles, for use with new or old roofs. They are offered in galvanized steel wire and copper wire.

THE S. ROEBUCK COMPANY, 172 Fulton street, New York: Illustrated circulars of Weather Strips, Wire Window Screens and Screen Doors.

PROUTY & GLASS CARRIAGE COMPANY, Wayne, Mich.: Illustrated catalogue, 1904, of High Grade Vehicles and Sleighs. These goods are made in a large variety of styles and kinds. Sleighs are made with and without springs.

THE F. E. WELLS & SON COMPANY, Greenfield, Mass.: New catalogue in which they have carried out their price-list to the details of assortments of Stocks, Dies and Bushings in sets, making the list very complete.

C. J. KIMBALL COMPANY, Bennington, N. H., for whom the Allerton-Clarke Company, 97 Chambers street, New York, are direct representatives: Complete catalogue of the large lines of Butcher, Shoe, Kitchen and Drawing Knives, Screw Drivers, &c., made by them. They also make boning, bread, cake, cigar, factory, fish, oyster, palette, paper hangers', pork, putty and Sticking Knives, Slicers and Tanners' Fleshers.

NAFEW & GELSTON, 453 Canal street, New York: Catalogue of their Samson Wire Brushes, which includes Foundry Brushes in a large variety, Car Wheel, Scratch, Ship's Bottom and Boiler Plate, and Braziers' Brushes. They also make lines of File Cleaning, Wheel, Drop Forge, Rotary Butcher Block, Stove Cleaning, Stone Cutters and Boiler Tube Brushes, Scrubbing Brooms, &c., all of wire, as well as a number of whalebone and Tampico Tube Brushes, and the Samson Nail Puller.

THE GALESBURG CORNICE WORKS, Galesburg, Ill., have made arrangements to manufacture the American Boy Collapsible Horn, an invention of C. T. Childers, recently patented.

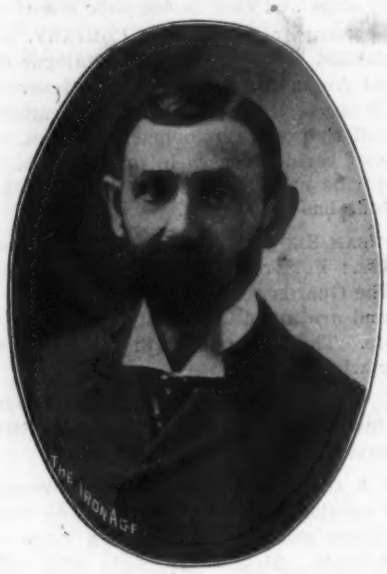
North Dakota Retail Hardware Association

THE seventh annual convention of the North Dakota Retail Hardware Association was opened in the United States Court room, Grand Forks, at 2 p.m., January 27, under the most auspicious conditions for an interesting meeting. For the first session the attendance was very satisfactory. Vice-President H. F. Emery presided, and introduced Acting Mayor R. M. Carothers, who delivered an address of welcome to the assembled merchants.

Vice-President Emery's Address.

Vice-President Emery responded in a very happy manner, and took occasion to say some pleasant things of President H. N. Joy, who until recently had been engaged in the Hardware business at Hamilton, and was a strong factor in the organization and upbuilding of the association. After acknowledging the hearty welcome of Mr. Carothers, Mr. Emery said:

Another year has passed, another page of history has been written, and again we meet, for our seventh annual convention, to work along the same lines of co-operation and development of the Hardware trade. We lament our worthy and honored president has found it



H. F. EMERY, President.

necessary to seek another climate. Mr. Joy left North Dakota on the night of January 5, with the expectation of making his home in the South. I would that his mantle had fallen on other shoulders, and I assure you it would give me great joy if Joy were home. In losing Brother Joy this association parts with one of its very best members, and one whose place will be hard to fill. Wherever he may go the best wishes of the North Dakota Hardware trade will follow him. I therefore ask your kind indulgence and co-operation in carrying this meeting through as successfully as he did the last.

The year 1903 was an eventful one in many ways. Like the preceding year, the dealer had to contend against an upward market, especially in such articles as are composed wholly or partly of wood. It is a deplorable fact that the average retail merchant

DOES NOT ADVANCE HIS PRICES

with the market. Only when stocks are exhausted and he has to replenish does his price go up, and very often then not in proportion to the advance, thinking that perhaps the next order will be at the old price, or it may be the merchant across the way has a large stock at the old price.

The year of 1904 opens with different conditions confronting it than has probably been witnessed before. On every side it is seen that conservatism is the motto. Now I would not convey to you the idea that by being conservative we need to take a pessimistic view of the future. On the contrary, at this particular time we should take an optimistic view. The best informed men of this country have contended that a great many manufactured goods are higher than the raw material and labor would warrant, and the belief that such goods are to seek their legitimate channel is one of the reasons that has brought about these conditions. That the country at large, and especially the West, is in a prosperous condition is a settled fact.

"WE ARE THE PEOPLE."

Two old factors shaping the ups and downs of the country have been put to sleep and buried far below frost line—namely, that Wall Street and Presidential elections do not control us to the great extent they did in former years. The years 1902 and 1903 have demonstrated that we have outgrown Wall Street. Slowly but surely are the Western States shaping the destiny of our politics. The old cry of the school boy, "We are the people," has become a living fact. It has been placed on our Western banners and unfurled to this nation, proclaiming from the West to the East and North to South. We are the producing people and must be respected. That large order for 1,000,000 barrels of flour to be shipped to China is worthy of our notice and congratulation. When our Western No. 1 hard takes the place of rats, rice and chop sticks, it will add another page to our history.

The great combinations, trusts, pools and gigantic corporations are as but small clouds covering the sun, for the saying of Abraham Lincoln that "All the people cannot be fooled all the time," is as true as when uttered over 40 years ago.

Gentlemen, take it all in all, it is well we have assembled here, that we may exchange thoughts and enlarge our views for the battle of the year. Everything considered, the Hardware merchant has a great opportunity to show an increase on the right side of the ledger at the close of this, the best of all years, 1904.

Mr. Emery called particular attention to the Question Box. He urged that it be used early and often, and that questions be deposited on every subject on which any member sought light.

He named G. W. Wolbert, Bismarck, and J. H. McCollom, Hope, as Committee on Transportation.

Uniform Retail Prices and Fixed Terms of Sale by Retailers.

was the subject handled in the first paper, presented to the convention by H. J. Hellekson, Fairmount, and it developed an interesting discussion.

Mr. Hellekson reviewed many of the evils arising from too close competition among local merchants and the campaign for trade waged by the catalogue houses. He thought that an information bureau conducted in connection with or by the State association, which would fix the basis of profit, would be a step in the right direction. He cited instances of local competition which might be avoided by such a plan, and then spoke of the terms on which retail merchants were required to sell their goods, paying particular attention to the practice of many of carrying open accounts for a full year. He thought that this plan could be easily remedied by the association, and contended that business principles injected into the retail business in the Hardware line would result in customers thinking much more of the merchant than if his business was allowed to drag along in a slipshod manner.

Vice-President Emery, H. F. Strehlow, J. A. Cole, W. H. Pinkerton, H. T. Helgesen, William McIntosh and O. A. Gallup took part in the discussion, and many plans for fixing the profits on goods were advanced, and the wide diversity of opinion showed conclusively that

conditions varied in the different localities represented in the discussion. No plan was advanced that was thought feasible enough to result in any action being taken by the association.

Efficient Salesmen.

This subject was handled by W. H. Pinkerton of Lakota. The paper, which was not discussed, was as follows:

In taking up this subject, which we all realize is a large one and intimately connected in many ways with nearly every department of mercantile business, from the buyer to the man who collects the accounts, I take the liberty to encroach on these various departments as occasion seems to demand. In justification of this I need but call your attention to the fact that a salesman must not be held accountable for the mistakes of the buyer nor yet of the collector, who may turn a good customer away by lack of tact in his work. These suggestions ought to be of more value by thus broadening the scope of our thought, from the fact that many, if not most, of our Hardware dealers in North Dakota are both buyer and salesman, and possibly collector, too. In pursuance of this idea we ask you to remember that as buyers we must do the planning that will result in sales when the opportunity comes to the salesman to show his worth. This caution may seem unnecessary to many of you, but wait a moment. Take as an illustration the Steel Range business, and in this there is a lesson for the buyer and the man who is expected to make the sale. While the ideas presented on this subject will be more valuable to the smaller and less experienced dealers in the State, yet they may not be wholly lost on the big fish.

SELLING STEEL RANGES.

We have seen three or four kinds of Steel Ranges of about equal quality and price, with no features of importance to distinguish one from the other. In such a store a customer appears on the scene inquiring if the dealer has a good Steel Range. "Certainly, here is a good one right here," is the ready reply, or words to that effect. You notice that we give him better judgment than to say that he has three or four good Ranges—some might even make this mistake. He goes on to show him the good qualities of the Range. This will take him but a short time, for this man does not know much about Steel Ranges, or he would not have allowed some shrewd traveling salesman to sell him so many kinds. When he has told the customer all the good points he knows, the prospective purchaser is probably not fully satisfied. He looks down the line and inquires, "What's the matter with this Range?" pointing to another make on the floor. Now what is our foolish buyer to say? Here are two or three more varieties of Ranges similar to the first. He cannot say, "This is not so good," if the Range is of equal price to the other, for if so, why should he keep it on sale? If our customer is a shrewd one—and most of them are—he discovers that our Stove dealer has several Ranges, and does not himself know which is the best one. He has formed the opinion that there are several good Ranges, and thinks "he will look around a little."

In another store he finds our wise buyer and salesman. The latter talks with him only a moment, and he has found that his customer wants a first-class article for heavy work and with a good large oven. He is willing to pay a price if satisfied that he is getting his money's worth. Our wise salesman has one Range that he can, for several good reasons, show to this intended purchaser as the best Range for this particular man's requirements. He has such definite convictions on the subject that he soon has his customer enthused, and a sale is closed. If it is thought desirable to handle three or four different kinds of Ranges, they should be Ranges of distinct points of difference, which are explainable to the customer. This gives the salesman the opportunity to decide what Range will probably meet the needs of this particular man, and in showing the article he emphasizes these points. The clerk—I cannot call him a salesman—who has not intelligence and energy enough to investigate the different kinds of Stoves and Ranges and other goods that he handles and form definite opinions that he can intelligently express—such clerk, I say, has missed his calling.

THE EFFICIENT CLERK

takes a broad view of the wants of the trade. If the Stove customer is a poor man or wants something for temporary use, do not try to sell him the best you have in the house, even though it would do his work. You should have a Stove on the floor that you can conscientiously recommend as the equal of anything made at a similar price. But to get to our subject in its purity.

Our efficient salesman will make the most of any opportunity, in or out of the store, in making himself friends. He can, by his cordial words and actions, cement the ties of friendship with customers and draw new ones by the same means. Some clerks are so short sighted as to think that they have done their work when they have shown the goods that the customer asks to see, and then when the closing hour comes and they can lock the door, the interest of their employer is not thought of till the store is entered again. Just here some clerks who

C. N. BARNES, Secretary.

read this will say, "Do you want us to solicit sales after hours," and I would answer, "Very seldom, unless approached on the subject." But in a thousand ways between the opening of a year's business and its close, one can remember his employer's interests in some slight way that will be of benefit to him, and what is a benefit to one is also a benefit to the other in the end. A salesman who is uniformly friendly and courteous unconsciously draws his friends and associates toward the business house with which he is employed. The world is full of employers who are overworked and are constantly looking for the efficient young person on whom they can shift responsibility. The candidate for one of these positions can and must show his fitness for the promotion while he holds the more humble one. Some assume to say, "When my employer pays me more I will work harder and be more efficient." This is beginning at the wrong end. He must first make himself valuable, then promotion will come. It may be in the service of the same man or another.

An efficient salesman will be careful to

KEEP SEASONABLE GOODS WELL DISPLAYED.

This often causes extra work, but if the spare moments are improved this can be done without interfering with his duties in waiting on the trade. The clerk who finds much time to sit on or lean against the counter in business hours will soon have all of his time at his disposal. With proper discretion we can present the merits of new goods that are placed in stock, with which the trade is not familiar. This must be done carefully, pre-

senting only such goods as we are sure will interest the party, and taking his time only when we are quite sure that he has it to spare. There is trouble at times in larger stores where several clerks are employed, by a desire on their part to joke a man and have much sport during times when trade is quiet and they have no customer to occupy them for a short period. On such occasions they may be inclined to gather in one part of the store and indulge in noisy fun. This interferes with the work of the office force, and if there is one customer in another part of the store attempting to purchase goods, the sale will be much interfered with by a burst of boisterous laughter from these idle clerks. Our stores and employees should create a business impression on those who come to inspect our wares. I do not want to be understood that salesmen must put on a long face, as we sometimes express it, but any sport and fun should be of a quiet nature, which will not interfere with the work of the establishment. Cheap jokes and undignified conduct do not tend to build up any mercantile business. Our friends usually visit us in our homes or at other social gatherings. At our stores they expect to be met in a business way only, as a usual thing.

Efficient salesmen, in taking orders to be delivered, will be very careful to get all the details that are necessary to the intelligent filling of the order. They will also note if it is a rush order and see to it that any promise made is diligently carried out. Valuable salesmen will not extend credit except as authorized to do so. Much tact is required in handling

APPLICATIONS FOR CREDIT

so that they can be referred to the credit man without making the customer feel that his case is held up unnecessarily. It is usually best, if the clerk can spend the time, to go with the applicant to the credit man and explain the case in a few words, simply stating the man's needs, in so far as he understands them. He should not assume to make any recommendations, however, but withdraw, leaving the customer to the tender mercies of the credit department.

The efficient salesman must give careful attention to any complaint, whether it be trivial or of more importance, remembering that the customer thinks it of some importance or he would not report it. These should usually be reported to the manager, except in cases where the clerk is certain that he is able to fully adjust the matter. The least said about competitors the better. As a rule, let them do their own advertising.

An efficient clerk will check in all goods that come to his department with great care, reporting any shortage in an intelligent manner. He will see that shortages or goods in bad order from the railroad company are correctly noted on the expense bills before making receipts. If these details are carefully looked after there will be no trouble in collecting damage from the transportation company. This can be done with express shortages or damage either in handling or delay. In getting information on which to base a claim against express companies, we must be even more careful than on the freight claims. Another source of loss arises from goods being stolen from tin shop or rear door. It should not be necessary for the manager to look after such matters. These doors should be carefully looked after, that there may be no drain in that direction. The front door also needs attention, for a different purpose, however. Those who have charge of or happen to be near should see to it that the door is opened and closed for every lady, if possible, and for the men, too, when practicable. If the door is controlled by check or spring, it is often very difficult for a lady to get in or out. In this it becomes a very practical matter, as well as a courtesy which will be very much appreciated. To sum it up, the efficient salesman is a man of ability, who will look after his employer's interests as though they were his own. He will grow into and make himself such a valued part of the business that he will either get a good, steady increase of salary or be able in time to get an interest in the business. If not, after the proper time, when he thinks he has become sufficiently conversant with the line of business, he may, by giving timely notice, withdraw and enter business for himself, with good prospects of success in the venture.

THURSDAY MORNING SESSION.

The largest attendance at any one session of the association was present at the meetings held on the second day of the convention.

Should the Hardware Jobber Handle Stoves.

George L. Nye, proprietor of the Minnesota Stove Company, Shakopee, Minn., presented a paper on the subject, "Should the Hardware Jobber Handle Stoves?" Mr. Nye contended that retailers would be better cared for by dealing directly with the manufacturer than with a jobber, who, in turn, had to go to the manufacturer. Mr. Nye's paper was as follows:

The way this question is presented to me, I do not think it is open to debate or criticism. "Should the Hardware Jobber Handle Stoves?" I think this is a question that the jobber is the sole judge of. If he is sufficiently supplied with the necessary funds, and he is satisfied they will return him a satisfactory profit, he will, no doubt, handle them, and I might add in this connection, it is probably the logical outcome of the evolutions in business and business methods that are continually taking place. The fierce competition in the Stove business has probably brought this question to the jobber rather than the jobber seeking it. I mean by the evolution of business, the tendency to concentration of business to the end that it can be done at a less cost. I do not think, however, the time has arrived when the jobber will give to his customer the difference between what it would cost him in the selling cost of Stoves and what it would cost the manufacturer to sell the same direct to the trade, and I also doubt very much, under the present methods, whether there would be any material saving on that score. The jobber of necessity would have to carry these goods in his warehouse, and also there would be a considerable outlay for advance freight charges and loading and unloading, and also quite an item in the matter of breakage, which, I think, would offset the difference in the saving in actual selling expense. I think the jobber will settle this question for himself, and, in fact, has done so. I would, however, like to put this question in a little different form that would open it for discussion. I would say: "Should the Retail Hardware Merchant Buy Stoves from a Hardware Jobber?"

A SERIES OF QUESTIONS.

I will not undertake to say "Yes" or "No" to this question, but put it to you for your discussion. In the first place, is there anything to be gained by the independent buyer in seeking a market through the jobber? Would not encouraging the jobber to handle this particular line have a tendency to further demoralize the Stove trade? Will the jobber not seek to dispose of his goods in this line through new people that have not heretofore handled Stoves, and would not the jobber insist on selling a larger line of Stoves to the dealer for whom he is already carrying a large line of credit, and when this dealer gets this overstock, and it comes time to pay for it, would he not be inclined to sacrifice these goods, knowing that he must make some returns for them or add to his already overburdensome account? The jobber of the present day also has so many lines that he has a great many customers in different trades in almost every town, and if the jobber did not succeed in establishing satisfactory relations with some first-class Hardware dealer, would not the merchant that is handling some other line think he was entitled to buy a Stove for his own use through the Hardware jobber?

Would the Hardware jobber in the Stove trade not have a tendency to restrict trade in the sense that it would prevent Stove foundries from springing up in our Northwestern centers? As the jobber would undoubtedly get his supplies from concerns already in existence that would be willing and glad to dispose of such a share of their output as would enable them to keep that output up to the maximum, and, well, what remained to his own trade? Would the usual number of Stove sales-

men exist that now call on you, and, as I said in the first part of this paper, would these same goods go to the retail trade at any less price, or would the jobber retain the profit derived from his ability, if any, to market these Stoves at a less percentage of cost than the manufacturer? Would you get these Stoves in a better condition from being handled through a jobber's warehouse? Would you get your duplicate orders filled more promptly through the jobbers, or would you be more apt to get back an order slip from the jobber saying he would have a car in in a few days? Would it be more satisfactory to get a card from the manufacturer stating the exact date he would make shipment, and would your shipment of repairs be attended to more promptly from the jobber or the manufacturer? Would your claims for breakage in transit be more promptly attended to by the jobber or the manufacturer? Would you be more apt to have a shortage of, possibly, a very small piece, that would make the Stove unfit for market until it was replaced, or would the goods come to you in better condition with brighter nickel? Would a bolt lost out in transit be replaced more quickly by the jobber or the manufacturer? Probably a great many other items might be added to this list. If you worked up a trade on a line of Stoves that you bought of a jobber, what assurance have you that the jobber can furnish this same line next year or the year after? If you should happen to sell a Stove bought through the jobber, and it did not give your customer satisfaction, would his traveling man give the same attention to seeing that these faults, whatever they were, were rectified, as the Stove salesman now does? And, lastly, would you like to see the army of Stove salesmen who now call on you, patronize your hotels and liveries and other local merchants and local enterprises, reduced to a corporal's guard, and this saving of expense revert to the jobber and the center where he stores and handles his goods?

I think there is no doubt that there is not a Hardware merchant in your great Commonwealth who is not able to answer these questions for himself and to his entire satisfaction.

H. D. Final of the Marshall-Wells Hardware Company, Duluth, Minn., happened to be the only jobber present handling Stoves, and he was called on. Mr. Final held that the jobber had a legitimate right to handle Stoves, and that, owing to high freight rates from remote manufacturing centers, the retailer was able to buy Stoves in large or small quantities of the jobber at more satisfactory terms than of a manufacturer. Another feature that he brought out was the fact that the jobber could supply Stoves when desired in the quantities needed, doing away with carload shipments from factories.

H. T. Helgesen of Milton acknowledged the force of the argument favorable to buying of jobbers in order that large stocks and bad seasons could be better avoided. He thought, however, that all manufacturers should have Northwestern depots, and claimed that as the retailer was required to pin his faith to a certain brand of Stove, the manufacturer probably would give better satisfaction than the jobber.

R. A. Grim, representing the Michigan Stove Company, contended that the manufacturer was the one to patronize, and made some good points on the desirability of handling trade-mark Stoves of known value.

G. W. Wolbert, Bismarck, brought out the point that the jobber was not always careful in selling Stoves, citing instances where purchasers in other lines handled by a jobbing house were able to buy Stoves or other articles not in their line for themselves or for their friends, thus injuring the legitimate dealer who carried a line of the same Stoves.

Our Troubles.

This was the title of a paper read by G. W. Wolbert of Bismarck, as follows:

I take it for granted that we have troubles, or we would not have these annual gatherings. It matters not whether our troubles are small or great, we all have them, and the dealer who is new in the business has probably more than he anticipated. Most troubles in this world are imaginary, few are real. There is a saying, "Never trouble trouble till trouble troubles you."

The Hardware dealers of North Dakota have followed this saying, and on account of evils existing which could only be corrected by organization several of the dealers met and started this association, which has grown so large that it now numbers nearly all the Hardware dealers in our State. Troubles had been here before, but from the time of organization till to-day the secretary has never been free from the troubles about which we trouble him. Our kicks are always with him. Do you appreciate what such a position means, and the work it requires of him, not alone in letter writing, but also in thought? Among many of the childish thoughts which we, as grown children, are apt to carry with us into business, is that of money worship. You are aware that some men think that an official representative of a large jobbing firm or manufacturer is entitled to more than ordinary respect. Don't fall into this error. They are human like others. Many of them are avaricious. Some will tell the truth in their first letter. A few follow the Golden Rule, but the larger

H. T. HELGESEN, Treasurer.

number are like David Harum, "Do unto the other fellow the way he's like to do unto you—and do it fust."

Let me ask you, Why should you expect them to be perfect or free from errors? Can you name any body of men in the State, Church, secret society or business life whom you can trust individually to be followers of the Golden Rule in all their relations with their fellowmen? Our greatest trouble with both the jobber and manufacturer has been for them to be honest.

Complaints have been made to the association about

GOODS BEING SOLD DIRECT TO CONSUMERS,

and when the matter reaches the offender's attention he says it was an error and will not occur again, or else denies the sale entirely. And the same error has been known to occur again between the same parties. Personally, I have found only one way to stop such errors and that is this: stop all buying from such houses. It will take nerve to turn down an old friend and an old house, but do it for your own good. It will give you backbone for the next fight, and also aid your neighbor.

Right here I want to say that the traveling salesman is one of your best friends. Give him your time as soon as possible, and get all the information you can out of him; in short, pump him dry and then prime him with a nice order. In doing this, "The quality of mercy is not strained, it blesses him that gives and him that receives." 'Tis all he gets in this world that really seems to make life a dream, and often an order from you will make him dream.

Don't let any one tell you that you must sell certain lines of goods or you will lose trade. Such talk may often sell you goods, but not always to your profit. You can sell any line of first-quality goods. What difference

is it to you whose name is on the goods, so long as you know you can return for credit all defective goods returned to you?

COMPETITION.

I wish to remind you that the worst competitors many merchants have are themselves. They want to sell the same brand of goods a trifle cheaper than the other store sells them. They think thereby to win trade. Or they will buy the cheaper quality of similar goods, and see how low they can sell them. Where is the gain? Possibly in time you may kill off your competitor, but have you also thought of two other things which may occur: either that he may get busy after you and ruin you financially, or if you succeed in your aim, a new man may come along, take his business and drive you out?

Did it ever occur to you that people neither eat nor drink Hardware? If a woman has a good Wash Boiler she don't want another because it is cheap. It might rust faster hanging up in the shed than the one she uses every week.

I suppose you are in business for the profit in it. If so, sell your goods on a profitable basis and strict business principles. The meanest man in trade to-day is the one who is at all times after his competitor. Just get busy, leave your competitor alone, and go after the trade on modern ideas. Blow your own horn and toot your own whistle. Don't be afraid of the best goods, get good, fair profits, and always do as you agree with your guarantee.

BEWARE OF THE SPECIALTY MAN.

They are all nice men, but they pick your pockets of profits. When you find one profitable seller, you usually find eleven that will stick closer than a mother-in-law. From the very nature of the business the man who sells "specials" and gives exclusive agencies to every man in the town who will buy from him is a "one-trip" man, and you will never see him again. Your order will be filled, and you will be full of fight and loaded; both with goods you cannot sell and wrath on traveling men. Think it over, don't do it again, and save this trouble.

Another man comes along and tells you about the nice profits he can save you on carload orders. You know that it is only in favorable years that you can sell a full carload of these goods. Unless you have surplus money don't buy the carload, but purchase as you need the goods. Then you will avoid the trouble of paying for goods unsold.

The big secret of making money in selling goods is this:

TURN OVER YOUR CAPITAL FAST.

In doing this you may occasionally pay a slight advance in prices, but at the end of the year you have made more profit, as your capital has produced returns every 60 or 90 days. Many dealers have too large stock for the tributary trade. That is the secret of the jobber and his success on small margins. He turns his capital over from four to eight times each year, and if only on a 5 per cent. margin each time, he has from 20 per cent. to 40 per cent. annual profit. You do the same. Try it.

Do you ever read the catalogues sent out by the catalogue houses? It will pay you to do so. In them you will find advertised many goods sold by you. Just cut these goods out of your stock, and put in better goods of other makes. I will try to explain how you will save trouble to yourself in doing this. Personally, in my own business, I will go even farther than this. Never forget that when the mechanic or farmer comes into your store for any article, at that time you are the manufacturer, for it is your guarantee to him that he considers, as he knows you personally, but will never see the fellow down East who made it. The manufacturer is lost sight of and you are the man behind the guarantee. Whenever a man tells me he can only sell one line of Saws, Files, Hammers, Locks, Stoves, Forks, &c., and his trade will buy nothing else, I always consider him as a poor salesman, or he is a picture liar, one who prevaricates to please his fancy. A good salesman will sell anything he knows is right.

"Men are four: He who knows not, and knows not he knows not; he is a fool, shun him. He who knows not, and knows he knows not; he is simple, teach him. He who knows, and knows not he knows; he is asleep, wake him. He who knows, and knows he knows; he is wise, follow him." Whenever you see any unsalable goods put them to the front, put a price on them to sell; if you cannot get cost, get 75 per cent., 50 per cent., 25 per cent., or, if not sold, be a good fellow some day and give them away to some deserving person who will appreciate them. You have made a good "ad" of it, anyway, and saved the trouble of invoicing it.

HAVE FIRST-CLASS CLERKS AND ARTISANS,

as they are your best advertisers. Don't forget also that the laborer is worthy of his hire, if he is worth having at all.

Have your stock in clean, orderly condition, and save time and trouble in looking for goods. Don't sprinkle your floor or use a feather duster. Both are out of date and cost you many dollars every year. Use a good floor brush for sweeping and a cloth as a duster; you are then accomplishing your object—the permanent removal of dirt.

Don't neglect the insurance department, as it is a money saver for you. You need all you can get of this. Personally, I am a Republican in politics, and therefore in some things also a "stand pat" man. We must all "stand pat" on our association work and give all the aid possible to our officers. But don't "stand pat" in your dealings which have caused you troubles like I have enumerated.

Committees.

Vice-President Emery announced the following committees:

NOMINATIONS: H. T. Helgesen, Milton; W. R. McIntosh, Bottineau; R. L. Scott, Jamestown.

PRESS: John Nuss, Grand Forks; S. D. Bostwick, Bathgate; U. S. Conn, Fargo.

RESOLUTIONS: W. H. Pinkerton, Lakota; O. A. Gallup, Edgeley; H. J. Hellekson, Fairmount.

THURSDAY AFTERNOON SESSION.

Upon reconvening in the afternoon, Vice-President Emery introduced R. A. Grim of the Michigan Stove Company, who read a paper on "Invisible Assets." At its conclusion, Mr. Emery called attention to the fact that it was the first paper presented to the association by a traveling man, and gave due notice that others would be expected to come to the front for the next convention. Mr. Grim's paper was as follows:

Invisible Assets.

I can assure you it gives me the greatest pleasure to meet with you again. During the past ten years I have visited you, and I look back upon that period as the best part of my life, and my earnest desire is that I may be permitted to call upon you for another decade. I feel that the year which we are beginning will be a far more profitable one than the year passed. In the great agricultural West we have our unit of measure, the bushel of wheat. Combines and trusts may temporarily unsettle values until it takes more bushels of wheat to buy a given article than the article is really worth, but the law of supply and demand is the great leveler that finally makes things equal. What we are gathered together here for is mutual benefit, to find by exchange of ideas a higher level upon which to conduct business, to gain some knowledge from the more successful, and to help those whose affairs are not in as satisfactory a condition as would be desired. The commercial agencies tell us that over nine-tenths of the men who enter mercantile life are not successful. What we desire to combat is this

FRIGHTFUL FINANCIAL MORTALITY.

We see two men start into business in apparently equal conditions. In a short time conditions change; one either remains in the background or fails, the other forges to the front. I do not think there is a better source of information as to why this thing exists than the salesman who calls on those men in a regular way. He has in his mind's eye the individuality of each man he calls on, and as this man or that falls below the

average he can foretell almost to a certainty the outcome. In other words, we were born with certain traits of character, certain visible assets, that fit us to be a success or a failure in mercantile life.

I think, from a financial standpoint,

INDUSTRY IS THE STRONGEST ASSET

a business man can have. Dun or Bradstreet do not take it into consideration, but give me the industrious man with a small capital in preference to the ease loving one with larger means. The industrious man will make the most of the means at hand, and, if he is possessed with the ideas of order, will present his goods to the trade in such a way as to gain business.

Right at this point I will say that one of the greatest assets a man can have is the faculty of presenting his goods in an attractive manner. I know dealers who could earn a good salary as window trimmers. A nice, clean window full of bright, fresh goods is the cheapest advertisement a dealer can have. Goods nicely sampled on the shelves, Stoves nicely blackened on movable platforms. These are things that count for much in the character of the business. "A river is no clearer than its source," and should the proprietor be lax in the arrangement of goods, the clerks will soon follow in his footsteps. Don't open a box with a Hatchet or Hammer from stock, or use a Wrench that you intend to sell on the delivery wagon, as it damages the sale of the article.

CARE FOR LITTLE THINGS.

Along these lines comes a capacity for little details, and there is no business so large that we can neglect the little things. It is said of J. J. Hill that he knows every spike and switch stand on his road. Whether this is true or not, all the men who have made a conspicuous success are the ones who never despised detail. The master mind that leaves nothing to the attention of the hired man, so that he can be handicapped by the failure of this employee, is the merchant who will make a success in a retail way.

DIPLOMACY.

Another asset not down in the agency books is diplomacy. No matter how careful or how industrious he may be, if a business man is not diplomatic he cannot gain or keep friends. Every man should have his convictions and a right to his opinion, but to win friends do not thrust your opinions or convictions upon your trade. Many a man has driven away a customer by his outspoken and insistent harping on some subject that was repugnant to a part of the community in which he lived. Everybody's money looks alike when it is in the till, no matter what his religion, nationality or politics may be. It may take a good deal of self control not to call some Smart Alec down, at the same time he may be contemplating a purchase of considerable magnitude that would carry a handsome profit. By being diplomatic, I do not mean that we should agree with every one, and be an Ephraim Smith, but it is always better to maintain a dignified silence upon a question that may lead to a heated argument and make an enemy.

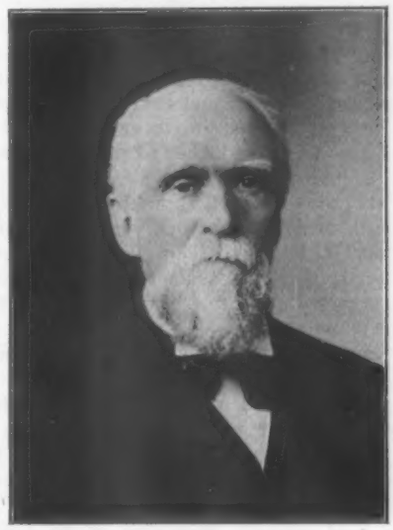
STABILITY OF CHARACTER.

Away above and beyond all else that may go to make up the component parts of a successful business man is stability of character. This is an asset that underlies the whole fabric of our business system. When the hard times come, and the crops fail and fortune hides her face, it is the man who is known to be honest with himself and his fellow men that will fare the best. This is an asset that it takes years to acquire; it cannot be assumed, it is never a veneer to a base nature, but like the growth of a sturdy oak can only come by years of right living. It is a trait of character that generally writes itself in the countenance; the one pearl of great price that fires cannot burn or floods destroy. The possessors of the virtue of honesty are the salt of the earth. Couple with this

THE GIFT OF INITIATIVE,

and you have a man who can grasp the coming chance; as we commonly say, a man who can see a hole in a millstone. A great many of us have not this gift, but, to use a homely expression, "We wait for a house to fall upon us before we come out of our trance," and see the other fellow getting the blessings we might have enjoyed had we had his foresight to grasp an opportunity that had presented itself to us. It may be the agency of a line of goods that would prove a source of great profit; it may be the purchase of a quantity of a staple commodity when it has reached bottom; it is the indefinite something that snatches success from failure. Some people will call it luck, others foresight, others good judgment. It is a faculty we all should cultivate in this busy, hustling workaday world.

These are the invisible assets that enter into business that make or mar our success in life. Industry, the great motor that surmounts all obstacles, that laughs at failure, that eliminates "can't" from our lexicon. It is this that transforms the tarred paper shanty to the complete establishment, but we must couple with this order, that we may move along smoothly and avoid disorganization; that we may show our wares in an enticing manner so that the public will be compelled to buy, as no catalogue house can show such an enticing array. Then let us have detail, looking after the small things, the little leaks that make great inroads upon us before we are aware of them. This is the faculty that makes us give just 16 ounces for each pound, just 36 inches for each yard, just 4 quarts



R. A. KIRK, ex-President National Hardware Association.

to the gallon, simply honest measure without any waste. With industry, order and detail, we couple diplomacy, the faculty that gets and keeps our friends and customers, that makes us a loved and valued citizen, a pleasing neighbor, one whom people care to visit socially or on business. Next we have the great foundation stone to the whole structure, stability of character, that makes your word as good as your bond, your simple declaration as good as an indelible ink signature, a look from your eye that gives you the hall mark of pure gold all the way down. If you add to all these that subtle something called initiative, that makes you do the right thing and do it first, you then have all the invisible assets that, though they are not down in the agency books, will insure your success, no matter what may come.

Jobbers and Retailers.

R. A. Kirk of Farwell, Ozmun, Kirk & Co., St. Paul, and ex-president of the National Hardware Association, read a paper in which he discussed some of the ways in which the interests of the retail and wholesale Hardware merchants might be benefited, as follows:

It gives me great pleasure to meet you again in your annual convention. I have probably had this pleasure at as many of your conventions as has been enjoyed by any one outside your organization. To meet a body of business men like this is both a pleasure and benefit to me, and I always go away from such a meeting feeling that it was good to be there. I take a large interest not only in hearing what men say who are connected with

the wholesale trade, or with manufacturers, but I take a special interest in the discussions among the members themselves in their open meetings, in which many features of trade as they affect the retail merchant are presented, and frequently from points of view that are new to the wholesale man. I passed such a day last week at Sioux Falls at the meeting of the South Dakota Retail Merchants' Association, and was greatly pleased to see the manner in which important matters were discussed by the members.

I do not see how any one can doubt the value of such meetings, or how a member of the association, who is really trying to make a better merchant of himself (and certainly this should be the aim of all of us), can be willing to absent himself from the annual meeting, unless for most important reasons. The inspiration that can be had from such a meeting should go with a man to his home and should last throughout the entire year, and especially so when reinforced by letters that are sent out from time to time by your officers.

When your Secretary asked for the subject of my remarks, I replied that I wished to address you on "Some Ways in which the Interests of the Retail and Wholesale Hardware Merchants can be Benefited." I assume that we will stand together on this platform:

THAT, IN THE DISTRIBUTION OF MERCHANDISE,

the best way that has as yet been devised is that the manufacturer shall sell to the wholesale dealer, he in turn to the retail dealer, and that the latter shall go to the consumer. If the manufacturer ignores this order of things and goes past the jobber to the retail dealer, or if the latter is ignored by the wholesale dealer who goes direct to the consumer, there will be trouble in either case. I urge therefore that one way for promoting mutual interests is that the wholesale house follow a strict policy of not selling to consumers. It has taken several years to work up to this line in some parts of the Northwest. The country is new, great grain and live stock ranches were established whose requirements were large, so-called stocks of merchandise in hands of the adjacent dealers were small and incomplete, and it required time to work out the problem. The solution has been complete, and I believe that for several years past there has been no ground for complaint on this score against any Northwestern wholesale house.

Now, I hold that the first part of the axiom that I have given is just as important, and that if the manufacturer would not go past the jobber to the retailer the mutual interests of the two parties principally concerned would, as a rule, be promoted. I do not say that there may not be a single isolated case in which the retail merchant might benefit himself by dealing direct with the manufacturer. I do claim, however, that such cases are rare, and that as a rule the retail dealer does not gain by such a policy. This is true even in staple goods, most of which are sold through the wholesale houses, and at prices as low as the factory will or really can afford to furnish them.

A few days ago I met a prominent manufacturer of Nails and Wire who was considering the question of going to the retail trade for orders, for the reason that the wholesale houses had already made their contracts and could take only a part of his product. After hearing his side I said: "Very well, I have no objection to your selling to the retail trade; all that we ask is that you will sell at the prices that have been fixed by manufacturers and jobbers." His reply was that this would mean that he would get no business, for the reason, as he stated, that "at an even price the orders would go to the jobbers, as the retail dealers prefer to deal with them." This puts the case in a nut shell as to staple goods. The argument is even stronger in the line of shelf goods. Some retail dealers are tempted, by an extra 2½ or 5, or perhaps 7½, per cent. to buy certain lines of goods in case lots when they should buy them by the dozen, or they will buy by the dozen or half dozen such goods as they really need only in ¼ or 1-6 dozen lots. If these men conducted their entire business on this policy, it would be safe to predict failure ahead. The manufacturer expects prompt payment and as a rule he gets it, and it is not a rare occurrence for the jobber to carry the account of such a customer and thus really furnish him money to pay the manufacturer.

I shall not enter into a full argument of the case and consider the many different and potent points of view in support of this side, as my time is short. I am sure that, as a rule, the retail merchant gains by confining his trade to the jobber. The little that he may gain in the small percentage that he may obtain on some goods is lost in other ways. Let me urge you, as a line of business policy, that you select carefully the wholesale house to which you give the bulk of your business, and that you give this house preference over the manufacturer.

ANOTHER WAY IN WHICH WE CAN MUTUALLY BENEFIT

each other is by more frequently putting ourselves into the other fellow's place. If we consider things rightly, we are closely connected with and vitally interested in each other. As you men in the retail trade prosper the wholesale man expects to prosper. When you suffer we suffer along with you. Let us accustom ourselves more frequently to look at things from the standpoint of the other man in the case. When questions of policy come up in the wholesale house let one of the first things to consider be, How will this affect the interests of the retail dealer? Or when anything harmful in the conduct of business by the retailer comes to the attention of the jobber, let it be his aim to try to assist all he can in the correction of the evil. Then, when anything occurs in their relations to which the retail dealer objects and feels like resenting the treatment which he has received from the jobber, let him take a look at it from the other side. For instance, some goods have been received in bad shape, or for some other season they are not as wanted and perhaps not as ordered. The first impulse is to ship them back by first train, and probably also to write a hasty letter. Do neither. Consider that, even if there were no fault whatever on your part, the blunder was probably made by some subordinate who had been depended upon by the house, and also that when the case comes to the attention of those in charge of the affairs of the house they will probably regret it more than you do. The longer I live the more advantage and necessity I come to see of putting ourselves more frequently into "the other fellow's" place.

Another way to secure mutual benefit is through our respective associations. I hold that, to the extent that this association of yours works for and secures your best interests, it will also be helpful to the wholesale interests. Growing out of this relation, we find that the wholesale and retail associations can and do work profitably together in combating some of the evils that jointly affect their members.

TAKE THE CATALOGUE AND MAIL ORDER HOUSE EVIL,

which I have no doubt you regard as the most pernicious one that disturbs the trade. In meeting this destructive competition the retail merchant must expect, first of all, to use his own resources to fight it. He may also expect to have all the assistance that the jobber can give him. There is also a very important part of the work in this field which can be done most effectively, and, indeed, must be done, by associated effort on the part of both the retail associations and the wholesale. The officers and executive committees of these associations realize the value of this work, and they have already accomplished some results.

THE NATIONAL HARDWARE ASSOCIATION,

which, as you know, represents a very large part of the wholesale dealers of the United States, and of which I had the honor of being the president for the two years just passed, has given this subject large attention. It has corresponded with and also seen in person many manufacturers of Hardware, whose goods have been made leaders, and have been advertised at prices sometimes even below cost to the catalogue houses. The same trouble exists to some extent with the department stores. However, this evil affects principally the city retail dealer. The retail Hardware associations throughout the country have also given this subject close consideration. Last May the Executive Committee of the National Hardware Association met in Philadelphia, and it had previously in-

vited to meet with it on that occasion the National Retail Hardware Association, which, as you know, is made up from representatives of the retail Hardware associations of the different States, your association being one of the number. An influential delegation came, and in it were the president and secretary, and also other prominent retail Hardwaremen from a number of the States. Two days were given to these conferences. Prominent manufacturers of Hardware were also present by invitation, and valuable work was done, which is still going on. I refer to this to show the association side of this work, the value of which is beyond computation. I am sure you feel that the evils from this source that now exist are bad enough, but the evils that have been prevented or restricted by this sort of work would have added greatly to the gravity of the present situation, and in work of this character the claims of your association upon you are enforced in the very strongest terms.

PARCELS POST.

Closely related with this work in the catalogue house, I wish to refer to the work of a league that has been organized in the East, called the "Postal Progress League," and which has just now made itself the champion of the Parcels Post bill, which it has lately introduced in Congress. This bill is made up largely of the same features as a bill that was before a previous Congress and that failed. This bill is now backed by stronger interests and is really a substantial menace to the business and general interests of the country.

If you have not given this subject special consideration you do not realize the magnitude of the danger that confronts the retail merchant. This bill proposes that the United States mails shall carry a package of merchandise up to 3 ounces for 1 cent, 2 cents for a package from 3 ounces up to 6 ounces, and 5 cents for 1-pound package, and 2 cents for each additional pound up to and including 11 pounds, which for the present is made the limit. You will see that for 25 cents a package of merchandise weighing 11 pounds would be carried from one extreme end of the country to the other. For 25 cents this package would be carried from Portland, Maine, to Portland, Ore., or to San Francisco, or to Juneau, Alaska, and for the same rate it would be carried to Honolulu or Manila. If a package were lost in the mails, the Government is required by the bill to reimburse to the extent of $10, if there has been no registration or valuation on the package. If registered and valued the Government would incure the package up to $25, at a mere nominal charge, so you see it is proposed to have the Government go extensively into the insurance business, as well as transportation, and on equally profitable, or, rather, losing, terms.

STATISTICS

from the Post Office Department show the actual cost in this country of carrying second-class mail matter to be about 7 cents per pound. Therefore, on the average 11-pound package the Government would receive 25 cents for a service that cost 77 cents. Also bear in mind that as the proposed plan ignores all business principles in carrying packages long and short distances at the same price, the Government would be sure to get the long haul in excess, so that the average cost of carrying the 11-pound packages would be much beyond 77 cents; but it would in no case get more than 25 cents.

No argument can be offered in behalf of this monstrosity such as we all recognize in the cheap transmission of newspapers and magazines. All our people are willing that this shall be done, even at some loss, but to apply this to merchandise is a proposition that I cannot believe the American people, and especially the general public, will consent to.

This bill is backed by the catalogue and mail order houses, and some influential men, such as Colonel Pope of Hartford, are working for it, and money and strong personal influence will be used in its behalf at Washington and elsewhere. The large and yearly increasing deficit in the Post Office Department stands in the way of these marauders on the public treasury. The rural delivery system has added several millions yearly to this deficit, and it is possible Congress will not consent to open such a flood gate into the treasury as this scheme would surely do. Another objection to it that will help to fight it is the crowded condition of the mails that would be bound to follow in case of this bill becoming a law.

THIS CONGESTION OF THE MAILS

would simply be stupendous. A merchant or consumer at Portland, Oregon, for instance, in want of goods, could order, say, from New York, many goods in packages of 11 pounds and less, and instead of shipping by express or freight he would use the mail. Suppose he wanted a shipment of silks weighing 100 pounds or less, he could divide the goods into, say, nine packages and pay $2.25 for what would cost him, at present express rates, exactly six times this amount, while by freight the cost would be considerably larger than this charge by mail. The Government would lose several dollars in the transaction.

If this bill were to become a law we can now have no conception of the disturbances and loss the country would sustain from it. I urge you, individually and also as an association, to use your influence with your Members of Congress and your United States Senators to have them understand your determined opposition to the passage of any such bill.

W. H. PINKERTON, Executive Committee.

I would say, in conclusion, that the best way to promote our mutual interests is for us, each one in his place, to do all we can to remove the evils that meet us on all sides. To do this, let us work singly and jointly, in season and out of season. Do not let the hands say to the feet, or the feet to the hands, "I have no need of thee." We all have the constant and most pressing need of each other. Let us not stand back and criticise and find fault. The position of the kicker is a very easy one. Be patient. Do not expect trade revolutions to be made in a day.

Horace Hill of Janney, Semple, Hill & Co., Minneapolis, and Mr. Young of Hackett, Walther, Gates Hardware Company, St. Paul, heartily indorsed the position taken by Mr. Kirk in his paper, and assured the members of the association that they were heartily in favor of association work.

F. T. Barbour, Northwestern agent of E. C. Atkins & Co., manufacturers of Saws, was called upon to answer that portion of Mr. Kirk's paper referring to the proper way of doing business—manufacturer to jobber to retailer. Mr. Barbour explained that when his firm came into the field the jobbers would not recognize the line, and as they had steadfastly declined to allow their line to go to catalogue houses, there was nothing left to do except to go to the retailer, which had been found very satisfactory. Mr. Barbour took occasion to indorse what Mr. Kirk had said in opposition to the Parcels Post bill.

Charges Against Jobbing Houses.

Owing to the large number of jobbers present the members of the association proceeded to lay before them a number of complaints, chief among which were these:

1. Selling Hardware to merchants not engaged in the Hardware business.
2. Selling from catalogue to persons not engaged in the Hardware business, who secured catalogues by buying some other line of goods carried by the house.
3. Selling small quantities of bills to men who have post offices and keep a very small stock of goods, depending on catalogues to furnish friends and neighbors with the same goods that the regular dealer carries in stock, and often demoralizing the trade.
4. The shipping of goods by a merchant of one town to friends in other towns handling the same line of Stoves.
5. Selling Hardware to a man who handles a line of Harness, when the legitimate dealer in the same town handles a large line of the same firm's goods.

Mr. Kirk, Mr. Hill and other jobbers present explained how such things could happen, but that they were always mistakes, though the retailers had just cause for complaint. Mr. Kirk advised that legitimate Hardware dealers should take steps at once to inform the jobbers and at the same time notify the secretary of the association, if it was thought desirable, and assured the retailers that the jobbers sought on all occasions to uphold the legitimate dealer, and in saying this he not only spoke for himself but for all the jobbers represented at the meeting.

Mr. Kirk, who was not present at the forenoon session, was given an opportunity to speak on the Stove proposition. His house has for several years handled a line of Stoves. The line has not been changed and it is not expected that it will be, and he contended that the fact that retailers could buy Stoves while purchasing the regular line of Hardware, and could do business without so large a stock, made the jobber a desirable ally of the retailer in supplying the demand for Stoves of every description.

Mr. Helgesen, Milton, spoke briefly on the subject of catalogue houses, and advanced the theory that the regular Hardware jobbers might offer to sell to the retailers certain staple articles handled by catalogue houses at the actual cost, the retailer also selling at cost, thus doing away with the advantage that catalogue houses had in offering staples at low prices and making up on other goods that were usually ordered to fill up a shipment. The plan, he thought, would be beneficial to all, and he felt sure that if the jobbers were willing to do without a profit on these articles the retailers would be glad to sell at actual cost with the view in time of driving out the mail order business.

The discussion was friendly throughout, and the jobbers expressed the belief that now that some things had been explained the relations between jobbers and retailers would be more cordial.

The Merchant and the Local Editor.

W. E. Davis, editor of the *Hardware Trade*, Minneapolis, read the following paper, entitled "The Merchant and the Local Editor:"

Competition from the outside is daily making more necessary co-operation between the local merchants and the local editor. There are too many merchants who lack appreciation of the value of good newspapers. There are too many editors who do not attend to business. For that reason there are many newspapers not worthy of patronage.

Wherever the local merchants and the editor faithfully co-operate there you will find a good trading point. The merchant should patronize a newspaper for purely business reasons. His personal relations with the editor, no matter whether pleasant or disagreeable, should not be taken into consideration.

The merchant should demand that the editor publish a good paper, and circulate it as much as possible in all of the territory in which the town has a fighting chance for trade. The local merchant experiences three kinds of competition:

1. Competition among merchants of the same town.
2. Competition between towns for the trade of a certain district.
3. Competition for the big center.

The view of some merchants is so narrow and restricted that the only competitor they can see is the fellow down the street. A town with such merchants is poorly armed to fight its trade battles. Usually where the merchants do not agree the town badly disagrees.

Other merchants have a broader idea of competition. They see that

THE MORE BUSINESS BROUGHT TO A TOWN

the more prosperous are all of the merchants. They realize that when they disagree with the fellow down the street they are dividing a business community, and that gives the competing town its chance. It has been the theory of some that quarreling business men draw more trade to the town because of badly demoralized prices. Even granting that it be true, it will be conceded that such a condition is not to be compared as a volume builder with a united business community making its intelligent offer of bargains systematically. One accidentally brings in a few extra customers by sending profits to perdition. The other goes after more trade on a carefully devised plan, one that is effective. But beyond all this is the

COMPETITION FROM THE BIG CITY.

More centralization of the retail trade is one result of the development of the country. Some sections of North Dakota do not feel the competition of the big cities as much as others. No part of North Dakota feels the competition of the big cities as much as Minnesota. But each year sees railway transportation a little better and a little quicker, and the mails a trifle faster. If it has not reached you it is on its way.

Free delivery of mail to the farmers through the establishment of rural routes is in real effect an assault on the trade prestige of the small town. It is a fine thing for the farmer. He is entitled to it. It is progress. No one has any right to stand in its way. But it creates a new condition in the battle for trade which makes it necessary for the business elements in the small town to work together as they never have before for the business of the town.

RURAL FREE DELIVERY OF MAILS

brings the farmer in far closer touch with the big city than has ever been the case. It furnishes the advertising department of the supply house and all other mail order concerns the long wished for opportunity to keep in constant touch with the farmers. Mailing lists of the new routes are prepared almost as rapidly as the new routes are opened. Circulars and other advertising matter in large quantities go over those routes every day.

The city daily is a big factor in this tendency toward trade centralization. It is the ally of the mail order house and the big city department store. The dailies published in the Twin Cities this evening will be distributed over many of the mail routes in this section of the Northwest by to-morrow noon. Under rural free delivery they go to the farmers' doors every day. The farmer's wife reads the ads, of course, and as a result of making the farmer a steady subscriber to some metropolitan daily the business of the mail order department in the big city department stores is increasing rapidly.

This is so much trade taken from the small towns. The local merchant may not see it go. If he did he might head much of it off by proving to the purchaser that the home stores sell just as good goods as cheaply. But frequently the mail order from the farm is gone and back before the local merchant learns what has happened, and many times he has no idea of the large amount of business going to the big centers from people whose trade he would be glad to get. Rural free delivery is giving the local merchant an entirely new reason for co-operating with his fellow merchants and the editor to keep the trade at home. Every twenty-four hours the city daily comes with its talk of city bargains. The small

town and the local merchants need a newspaper ally to offset this.

The experience of merchants during the past ten years has shown that the fight to hold the trade at home

GROWS HARDER EACH YEAR.

It is not always a question of price, nor yet that oft repeated argument of a "larger variety to select from." New competition always necessitates more effort. The simple fact that avenues have been opened whereby outside concerns can reach the local trade surrounding each town more easily than ever before, and outside concerns are taking advantage of it, makes the fight of the country merchant and the small town that much harder. Rural free delivery is here with objection and protest from the country merchant. Already the big retail interests in the big centers are following up this advantage with a demand for a parcels post. There was no good reason for opposing rural free delivery. There is a good reason for opposing parcels post. In fighting the parcels post the retailer is fighting the battle of the small town everywhere in defense of its trade prestige and its importance as a place on the map. This is ground on which the local merchant and the local editor co-operate for mutual benefit and the good of the community. There should be more of this co-operation on this very question than there is.

This necessity of defending the trade of the small town against the attack from the outside brings us to the relations of the local merchant and the local editor. Each town has a condition peculiarly its own, but there are some general conditions familiar to all. That there are too many merchants who fail to appreciate a good newspaper when they have it is plain. That can be seen by looking over the columns of scores of bright Northwestern newspapers. The number of merchants not represented in their columns is too large.

On the other hand, there are

TOO MANY POOR NEWSPAPERS,

sheets really not entitled to patronage. The editor may know little about the newspaper business as a business. He may be a fairly good printer, but a poor business man. He may be a fairly good business man, but a very poor editor. Again, he may be a good editor, a good business man, and a good printer, but he allows the devil to run the office, while he is looking after the politics of the county or smoking cigars with fellows who imagine they are slate makers in State politics.

When a merchant realizes the necessity of a first-class local paper to him in his business, he will probably ask himself this question: "What can I and the other merchants of this town do to make this paper more effective for the general trade interests of the town?" The editor should be constantly asking himself: "What can I do to make this paper a better advertising medium?" When the merchants and the editor of any one town get down to answering these questions, all of them have started on the road to more business.

EDITOR AND MERCHANT SHOULD WORK TOGETHER.

It would seem unnecessary to tell merchants they should work together for the good of the town. All of them believe in it as a principle, but when it comes to putting the thing into practice, their hatred of the fellow down the street often handicaps the work, and in the end actually damages the general trade interests of the town. Co-operation among the merchants of a town is the first essential. If they can agree on nothing else they ought to agree that more trade for the town is what they want, and they can afford to lay aside their prejudices for a time and all pull together as a business proposition.

The organization of merchants into associations has overcome much of this petty prejudice. Competitors meet face to face and shake hands now where in some instances not many years ago they were sending each other messages of bad will by the grapevine route, a route superintended by some customer who had a financial interest in keeping up hostilities. The trade association proves to each merchant that his competitor is not such a bad fellow after all, that there is really some good in him, and that he can pull with him for the general good of the town without losing any of his self respect.

There are many towns where the merchants do co-operate. They are marked towns. They are known in their particular section for the harmony and hustle of their business men. That in itself is good advertising. It makes business. Every man in them is talking for his town. He is praising its stores, the big stocks carried, and the enterprise of the merchants. If he goes to a neighboring town he is "plugging" for the home merchants. The enthusiasm is in the air.

TO CREATE SUCH ENTHUSIASM

lies in the power of the merchants of any town. They represent its heaviest interests. Eliminate the merchants' quarrels and put harmony at work instead, and you will have a far different community. Other factors in the town may clash, but they will not retard its progress materially. The competing lawyers may be at war, but lawyers' wars usually dissolve into wind. The jealousies of doctors amount to little more than gossip, unless all of them are in politics. But the merchants represent the commercial activity of the community. Whether that activity is being driven by harmony's powerful engine or simply pushed by individual concerns working independently depends upon the merchants themselves. There is a big difference in the results to all between the

H. F. STREHLOW, Executive Committee.

work of harmony's big engine and the unassisted efforts of the individual.

When the merchants of a town have fully realized the necessity of harmonious work against the outside assaults on their trade, they will take their local editor and his paper into full partnership. They will want to see it the best local paper in the county, for two reasons:

1. Because a large number of people will base their opinion of the town on the appearance of the local paper.

2. When any business man buys advertising, he wants the best article he can get. He wants to advertise in a medium that circulates as widely as possible in the territory he desires to reach.

That brings us to the editor. Frequently he is a mistake. Usually he regards his business as something else than a business. He forgets that it needs close attention every day, that it must be pushed in all departments and kept in good shape in every detail. Wherever you find a newspaper editor who works at his business with the system and sense a business man should have, you will find a good newspaper.

TOO MANY NEWSPAPERS.

The curse of many towns is too many newspapers. When you have one good newspaper, stick to it and discourage efforts to start another. You may be hot at the editor and actually rubbing your hands in anticipation of seeing him defeated in the next election, but forget that for a while and think of business. What does it matter if you and the editor disagreed in the last school

election, if by working with that same editor, patronizing his paper, and helping him work for the general interests of the town, you are increasing your profits by a few hundred dollars? Differences of opinion in every community are constantly flashing up and fading away, but opportunities for making money once gone never return. You are a business man; make the most of your opportunities. If two newspapers is a poor business proposition for you and your town, put your foot down on it and endeavor to persuade the other merchants—as a business proposition, remember—that one paper is enough. Put two papers in a one-paper town, and one of them will be a poor medium for your ad. The circulation of one good paper can be pushed successfully. You get more for your money. Every merchant who patronizes two papers in a town where there should be but one is actually losing a part of his advertising appropriation.

LOCAL PAPERS *vs.* CIRCULARS.

But to take the town which has the right number of newspapers, whether it be one or two, what is the editor doing on circulation and the general excellence of his paper? That expresses the duty of the editor to his advertisers. During 1903 we addressed inquiries to several hundred Northwestern merchants on advertising, asking them which, in their opinion, was the best medium for them, the local paper or the circular mailed direct from the store. A big majority declared in favor of the circular. Many went so far as to declare they received no results from the local paper at all.

Why is this? A large number of newspaper publishers are not giving their papers intelligent attention. To be successful as a business institution a newspaper must be wide awake on local and county news, and the editor must push the circulation to the farthest possible limit. He cannot get the circulation unless he gets the news. He is not entitled to the merchant's advertising unless the paper has the circulation.

One reason so many merchants lack faith in the value of their local newspapers as advertising mediums is that the editor does no aggressive or progressive work on the circulation. That type of editor is content to go along, year after year, with the same circulation in about the same district, which is usually the territory from which the town naturally draws its trade. An advertisement placed in such a paper reaches only the people who are in the habit of visiting that store more or less anyway, and unless the merchant is advertising something remarkably low the ad. frequently brings very little response. The local merchant is ambitious to reach into a wider territory. He wants to get his advertisement into the district from which a certain competing town is pulling a large trade, or into that other district where, he hears, a large supply of catalogues from supply houses has been received. Unless the editor has covered this ground with his circulation the advertisement is disappointing in this important particular.

Right here can be seen some of the work cut out for the editor who wants to carry his business to the farthest limit of his opportunities, and who is ambitious to make his paper of value to the town and its merchants. He must have in his mind the territory into which he desires to push his paper, and he must be devising ways and means of doing it. If the people of the Northwest district are trading in another town, or buying considerable goods of supply houses, can he do anything to stop it? Do they read his paper? Do they use his town for a market, and if not, why not? If the merchants of his town are paying as much for produce and selling goods as cheaply as any other, why should they not get the business?

THE NEWSPAPER CAN DO MUCH.

to attract people to the town. It should have a correspondent in all districts where the town meets others in the battle for trade. Its circulation in those districts should be pushed as much as possible. When he has done that the editor has done much to interest the people of that community in his town. He deserves material support from the merchants for such work. The weekly papers of North Dakota which have given proper attention to their circulation are, of course, the most successful. Adding circulation is putting betterments into the property, but there is an astonishingly large number of editors who fail to realize the value and necessity of those betterments.

The editor criticises the merchant who does not advertise. The merchant, in turn, says it does not pay. There is plenty of room for concessions and more enterprise from each. There will be some merchants who will not advertise until competition drives them out of business. There will be poor newspapers forever and forever, because poor newspapers are the hardest things in the world to kill off. But between those two extremes there is a

SPLENDID CHANCE FOR REASONABLE MERCHANTS AND REASONABLE EDITORS.

to get closer together as business men working for their bank accounts and the general good of the town. The merchants have the right to demand a good newspaper, run by an editor who is sending its circulation as far into the territory of neighboring towns as he can. The editor, in turn, has a right to ask good rates for his ads. and liberal patronage. The town whose merchants and editor get together on such a basis will be the best trading point in its section, and will keep most of its trade at home. That will be one town which will successfully resist the invasion of the concerns in the big cities. The others, where the business men lack enterprise and reason, are bound to suffer.

FRIDAY MORNING SESSION.

At the session on Friday morning the annual address of President Joy was read by Vice-President Emery, as follows:

President Joy's Annual Address.

For your information and action I desire to bring before you a brief report of the doings of the association since we last met in annual session. The year just closed has been the most peaceful and harmonious of any since our organization, seven years ago. Whether this indicates a lack of zeal upon the part of the officers to push matters brought to their attention by the members, inaction of the members in filing complaints, or less cause for them, I am not prepared to say. I am, however, of the opinion that the latter is the case.

Some few complaints continue to be made of manufacturers and jobbers selling to dealers who are not entitled to purchase Hardware and kindred lines at wholesale prices from those who depend principally upon distributing their product or merchandise through regular Hardware dealers, but complaints of this character are growing less yearly, and I think are now chiefly confined to the smaller manufacturers and jobbers. Our own State association invariably handles this class of grievances itself much more effectively than can be done through the National Association, and is entitled to all credit for anything accomplished along this line.

THE ABUSES CAUSED BY MANUFACTURERS AND JOBBERS

doing business in our territory, selling their wares to contractors at wholesale prices, still exist to a much greater extent than would naturally be expected, considering the professions of the guilty parties to the contrary; and from the experience of the past I am satisfied that it will continue unless our members bear down heavily in every instance where sales of this character are made. I would suggest that each member make it his special business to watch for violations of this kind, promptly report same to the secretary, with sufficient data and proofs to make the case stick; and if customers of the guilty house, write a personal letter to them, vigorously protesting against such methods. Never make a complaint unless you are sure of your ground, and then stand by it to the last ditch, promptly furnishing the officers with all the information they desire to effectively prosecute the matter to a final conclusion.

CATALOGUE HOUSES.

While we only are able to remedy abuses caused by manufacturers and jobbers, as heretofore enumerated, through our State Association, it is equally true that the National Association alone can help us combat the ills we suffer, on account of the ever present catalogue sup-

ply house. The business of the former is usually confined to two or three States, and they cannot afford to run up against the wishes of State associations, but the whole earth is the field of the latter, and to accomplish anything worth while the attack must be national in its character. The most optimistic of our co-workers has scarcely held, even in his fairest dreams, that the day would soon come when the catalogue house would cease to exist, and certainly nothing has transpired during the past year to my knowledge that would lead one to arrive at such a conclusion. The shipments of goods into our own territory during the past year have not, we think, decreased in volume, but we do think that the character of these shipments has undergone a change. A marked falling off in the volume of a well-known and standard brand of goods, displaced by inferior and unknown and unreliable brands, has characterized the shipments from these houses. Manufacturers of standard brands are, through the efforts of the National associations of both jobbers and retailers, doing much to correct past evils, and are assisting retail Hardwaremen to market their product in a manner satisfactory to all. These National associations are only just fairly started along this line, and will continue their good work until nearly all, if not all, standard brands of Hardware are sold over the retailers' counters at equally low prices as quoted by supply houses.

The latest production of the master minds of these concerns,

THE PARCELS POST BILL,

whereby they enlist the assistance of the National Government, and permit it to carry their goods at a loss, is still in the balance. Our National Association is leaving no stone unturned nor allowing any opportunity to slip to defeat this measure; but "never let up" must be the slogan of all merchants, wholesale and retail, and should have the co-operation of every citizen, or their efforts to thrust this burden upon the people will succeed. Papers during the past year have been placed in the hands of every member of this association, which, if used as intended, will assist very materially in defeating this pernicious proposition. If you have not done what you can to assist in this matter, go home and do it at once.

PEDDLERS' LAW.

Reference was made in my last annual report to a bill then pending in our State Legislature, providing for the taxing of peddlers. I am pleased to report that the bill became a law, and has been upheld by the Supreme Court. It is up to us now to reap the benefits of this legislation. While the rates provided for are inadequate, still, if the dose is repeated at frequent intervals, beneficent results will follow. See that it is.

"REFERENCE BOOK."

The first issue of the association "Reference Book" is a very valuable book, if used as its author intended. A copy of this book has been placed in the hands of every member without cost. Change sheets will be sent out from time to time, as occasion demands it. If you will keep it posted up to date it will assist you in keeping posted, and thus you will be up to date.

FIRE INSURANCE.

So many mutual fire insurance associations have sprung up in the State, which, in addition to the Minnesota Association and the National Fire Association, provide us with possibly sufficient insurance, that it would not seem advisable to take any action at this time looking to the organization of a State Hardware fire insurance company. In this connection I desire to call your attention to the active part taken by one of your representatives, ex-President Helgesen, at the last meeting of the National Association, in persistently urging upon that body the necessity for immediate action, and which resulted in definite steps being taken at that time, culminating in our present National Fire Association, whose claims to a portion of your insurance should not be overlooked.

TRADE PAPERS.

The various trade papers' attitude toward us is in no respect changed. From week to week these friends serve up in a palatable form articles commendatory of our work, untiringly urging loyalty upon the part of the membership, and endeavoring by forcible logic to induce indifferent dealers to no longer ignore the claims of the association upon them and not expect the faithful few to always carry their burden. These efforts are pregnant with good results and are appreciated by us.

In conclusion, I wish to thank the members for the confidence they have reposed in me, in twice electing me as president of this association, and as many times as representative to the National Association. In both of these positions I have endeavored to give you the best service that I am capable of; and if these efforts have met with your approval, my reward is sufficient. I am under lasting obligations to our efficient secretary, the one and only C. N. Barnes, and the members of the Executive Committee, for valuable assistance rendered during the past year, and for which they have my sincere thanks. I exceedingly regret my inability to be present with you at the annual meeting, and should our lives in the future fall in different places, permit me to assure you that I shall always be intensely interested in the welfare and progress of the North Dakota Retail Hardware Association.

Secretary Barnes' Report.

The report of C. N. Barnes, secretary, was presented, as follows:

In presenting to you this report, which is the seventh one that I have been privileged to submit, I find that its make-up will be of quite a similar nature to all preceding ones. Understanding that the report of a secretary is to outline work, &c., performed by him in his office, I will, as briefly as possible, explain to you what we have been doing during the past 12 months.

As this association has never made a practice of having any of its officers or a representative do any traveling through the State in its interests, the results looked for from such work necessarily must be effected by correspondence, and consequently my letter writing practically covers the very large portion of the work performed in this office.

MEMBERSHIP.

At the close of our last meeting a start was immediately made to secure as large a membership as possible, and it is a pleasure to inform you that we have to-day, in good standing, the largest membership that we have had since our organization was perfected. Our records show 151 good, live members, and the promise from quite a number that they will join at this meeting; so, by comparing our present membership with the available dealers in the State to draw our membership from, I believe we have much to congratulate ourselves on in this showing.

COLLECTION OF DUES.

The collection of dues is also quite a factor in the work of this office and necessitates frequent appeals on the subject, and with some it may have caused a little hard feeling toward me; but it has been with the best motive and for the good of the association that I have done this hammering. To succeed in any business project, where the collection of funds is required, it is necessary that their collection should be carefully looked after, and, having the success of our association foremost in my mind, is why this feature of our work has been followed up so closely.

INTERCHANGE OF IDEAS.

In the conduct of my work this year I have received a great deal of benefit from exchanging with other State Hardware secretaries printed matter that has been sent out from their different offices. This interchange was agreed to at a meeting of these secretaries in Chicago during the national meeting last March, and I trust it may be continued in the future.

REFERENCE BOOK AND PROGRAMME.

As in former years, we have issued for this meeting a programme, and included matter in it that entitles it to be termed a "Reference Book." The preparation of this book has necessitated quite a good deal of correspondence, as practically all matter contained in it has been secured through that channel. It has been the desire of your officers this year to issue a programme that would be of value to the retail Hardware trade.

This issue, as you will notice, contains a selection of many of the latest standard lists of articles carried in your Hardware stock, and also other matter that it has seemed would be of value to you in your business.

To make it possible to issue such a book, we are indebted to those who have taken advertising space in it, and I believe we should pass resolutions setting forth our appreciation of their help.

EXECUTIVE COMMITTEE MEETING.

During the past twelve months it has been found necessary to call but one meeting of your Executive Committee, which would indicate that we had not run against any serious difficulties in the conduct of our work.

INSURANCE.

A feature of our work that all our members do not avail themselves of, and which would be a direct benefit to them if they did, is the Mutual Association Insurance. Many of our members do carry such insurance, as we have at this date on the books of the Minnesota Association $103,650 of insurance in force. This is carried by 63 of our members. From this you see that not half of our members are taking advantage of the opportunity offered them of decreasing to quite an extent the cost of carrying their insurance. This company have never refunded less than 25 per cent. to their policy holders, and in addition to that have accumulated a very nice surplus, to be used only in case of excessive losses. At a conservative estimate, the amount of insurance our members are carrying in the Minnesota Company at this time means a saving to them of at least $900 per annum above the old line rates. So you can readily see the great loss that the 88 members that have not provided themselves with a single dollar of Mutual Hardware Insurance are sustaining this year.

In addition to the Minnesota Company we also have a National Insurance Company. The latter were organized about six months ago under the Pennsylvania State laws. The officers are men of experience in mutual insurance, and I am sure we are safe in predicting a successful career for this newly organized company. Those of you who are carrying the maximum amount that the Minnesota Company will accept, and wish to carry more, I feel sure would find it to their advantage to carry some in the National.

NATIONAL ASSOCIATION.

The past ten months, I am inclined to think, has been the most eventful period for the National Association since its organization. Its efficient officers have demonstrated in many ways that they are capable and in readiness at all times to combat against propositions that are continually springing up and harassing the retail dealers. We cannot commend their efficient work too strongly, and I would be pleased to have this association adopt resolutions showing its appreciation for the good work they are doing.

REMOVAL FROM STATE OF PRESIDENT JOY.

It is with regret that I make mention of the removal of President Joy from our State. He has made a most efficient officer of this association and was ever ready to give his time for its interests, and by his honorable dealings has won the confidence, love and respect of all who were so fortunate as to know him.

OUR ASSISTING FRIENDS.

We have been especially favored at this meeting by having with us several from a distance who came for no other purpose than to aid us in making this meeting pleasant and profitable. Their papers and addresses cannot help but be beneficial to us, and it is due them that we show our appreciation by appropriate resolutions. To the traveling men and representatives from firms soliciting trade in this State, who have also met with us and by their presence and addresses added much to the benefits and pleasure of this meeting, we should also express our appreciation. To our own members who have prepared papers and assisted thereby in making our meeting such a success, we should extend our gratitude in some fitting manner.

OUR OFFICERS.

Personally, I wish to express my appreciation of the officers and members of the association, who have always been ready and willing to assist me in the discharge of my duties, thus making my work far pleasanter while endeavoring to serve you.

The annual report of Treasurer W. H. Pinkerton showed the association to be in good financial condition, and the report of the Auditing Committee was to the effect that the books were found in perfect condition.

Trials and Tribulations of the Hardwareman.

The following paper under the above title was read by U. S. Conn of Fargo:

In a general way, I presume, the trials and tribulations of the Hardwareman and other merchants are the same, yet there are many difficulties which we meet that are of a distinctly Hardware nature. If each one present were permitted to pour out his tale of woe, our stories would be about as consistent as the description of the seven blind men who went to see the elephant. One of these men came in contact with the elephant's side, and thought it like a wall; another encountered a leg, and thought it like a post, while another got hold of the tail, and thought it like a rope. I shall briefly mention a few of what seem to me to be the hardest nuts we have to crack. At the head of the list, although not more important than some others, is

ADVERTISING.

To have a good stock, carefully selected, well arranged and properly displayed, is important, but to be profitable the public must be informed that such a stock exists. How to do this is a question. Shall we advertise in the newspapers or by means of circulars, letters, calendars, in programmes and so on through the almost unlimited number of channels so well known to all of us? Advertising should be regarded solely as a business matter, and from this standpoint the kind of advertising which brings the greatest returns on the investment should be regarded as best, and that kind of advertising which does not bring a return profit equal to the outlay certainly, as a business matter, should be dropped. In this last named class is a great deal of newspaper advertising. The reason that it is of so little value does not lie with the newspapers, but with the man who writes it. To be of value the ad. must be read by the public, and to be read there must be something in it to attract attention. This is not the case with a very large percentage of the Hardware ads, in the newspapers to-day. The day is past when the "Brown & Jones for Hardware and Stoves" ad. means anything. It is not read by the newspaper readers, and is of no more value than a billboard along the highway. The ad. should go into the description and value of the article enough to arouse the desire of the reader to visit your place of business. When people visit your store, then is your opportunity to do the most effective advertising, by fair dealing and courteous treatment. Writing ads., instead of being treated with indifference or no attention at all, should receive the most exacting, painstaking, thoughtful attention. Were this done by every Hardwareman we would soon have less occasion to hear the remark that advertising in the newspapers does not pay. We can well afford to profit from the form and manner of advertising by some of the great department stores, and follow the tone and vigor of their ads. We are frequently importuned by some programme committee or society to take advertising space, which we are morally certain is a waste of money. Unless the merchant desires to make a donation in this direction, he is not doing justice either to himself or to his business to take space of this kind. As a rule, traveling advertisers can be put into a fake list and treated accordingly.

We hear a great deal said to-day about catalogue houses and department stores. The method of each is based upon the same idea. Both inform the public in regard to their bargains. One does it by means of a catalogue, and the other by means of the articles classified and ticketed. The Hardwareman does neither, but does business to-day as he did it 25 years ago. He contents himself by having his goods piled up in digni-

fied rows behind his counter, and waits for the customer to come in and ask for them.

BARGAIN COUNTER.

But the department stores are educating the public to be a nation of shoppers. The shoppers desire to pass about in the store, examine the articles offered for sale and ascertain the price without causing themselves or any one else any particular inconvenience. The only way this seemingly can be done is through the bargain counter. If the Hardwareman does not have a bargain counter the shopper will go where it is. We as Hardwaremen may hoot at the department stores, at their prices, and the kind of goods they sell, yet this does not alter the fact that they have gradually taken a large amount of trade which legitimately belongs to the Hardware trade, and which could be held in a great measure by the Hardware stores if some imaginary dignity were laid aside. If the Hardware merchant does not have goods as cheap and as poor as the department store, he should get them and put them on the 5 and 10 cent counter and murder the prices. It is better to do this than not to sell them at all, and at the same time by way of contrast the merchant will have a better opportunity to sell something good. The Hardware merchant's attitude toward the bargain counter has had much to do with the development of the tin pan department of the department stores, and is now laying the foundation for the five and ten cent stores springing up all over the country.

The jobbing houses have it in their power to do a great deal to assist along this line by making prices to enable the retail merchant to meet department store prices. If the jobbers do not have the inferior class of goods carried on the bargain counters, they should get them to supply the retail trade. The department stores have no difficulty in getting all of this plunder they want. There is but one thing to do, whether we like it or not, and that is to meet the price, and jobbers must meet the price on some of these articles. To illustrate, ——— sell a 9-inch Pie Plate, made of coke tin, for $2.40 per gross, while the average jobbers' price for 9-inch Pie Plates, made from charcoal tin, is $3.50 per gross. The same difference exists in Pot Covers, Tin Cups and cheap Dairy Pans, and a number of other articles. What are you going to do about it, Mr. Jobber. Going to meet it? If you do not the retail dealer must sell at a loss, be undersold or buy from ——— and others of their tribe. Retail dealers need just a little assistance along this line, on some of the articles sold by catalogue houses. These houses quote some common things, the prices of which the public generally know, at about our wholesale price. What are we going to do about this? There is but one thing, and that is

TO MEET THE PRICE.

The less we do of arguing or bulldozing or laughing the customer out of his position on the catalogue prices, the better it is for us. In nine cases out of ten one can tell whether the customer is a catalogue advocate. If he is found to be, to meet the catalogue price with freight and expense added, with as little ado as possible, will do much toward establishing a customer's confidence in your prices, and will go far toward making him a home customer instead of a catalogue customer.

CREDIT.

While we may have trials and tribulations in regard to disposing of goods and meeting competition both at home and abroad, most Hardwaremen have the same things in the matter of credit. As a rule, every merchant, in his desire to sell, will take chances at times which he should not take. He will allow a customer whose credit might be good for a few dollars to have credit for ten times the amount without any definite understanding as to when to expect payment. As a rule, the matter of credit is a thing which must be settled by every man for himself. The merchant must be his own judge and jury in every case. If every customer should be required to give reference before receiving credit, and if all such things as Stoves, Bicycles, Refrigerators and articles of corresponding value, for which time is asked, should be sold on a lease, we would have far less grief in the matter of collections. If merchants should do more investigating before extending credit, have a limit as to time of credit, not be so afraid to say no, and follow the example of all jobbing houses, by giving a discount as a premium for cash, losses would figure far less at the end of each year's business. But so long as cash and credit are all one and the same, as is now universally the case in retail business, we must expect to add a percentage to our profit to cover loses.

There is just one individual to whom I desire to give my respects before closing, and that is

THE SPECIALTY MAN.

While the man individually is usually all right, he is the man of one idea; he sells and thinks of one thing. Because he sells a great deal of this one thing he imagines every merchant should do the same. He quotes special prices on so many gross of Thermometers or so many dozens of Clothes Wringers, or so many gross of some new-fangled Wrench or Lantern. The enthusiasm of the man and the special 5 per cent. often lead the merchant to purchase ten times what his needs are. Pay day comes, and often money which honestly belongs to some wholesale house is taken to pay for a two years' stock of this one article. Often before the stock of the special article is sold something superior displaces it, and leaves the remainder as dead property. If a thing is good, a few of the articles will show it, and then more of it can be purchased. If it is of no merit it can be more economically tested by a small purchase than by a large one. As a rule, I find it a good thing to be busy when the specialty man calls.

There are many things which I might say in regard to labor, incompetent, drunken tinners, sleepy, indifferent, disploya clerks, and so on, but I could not suggest anything better for these than to give no quarter to such. I suggest these as a few of our trials and tribulations. There are many others which I might mention. There are possibly others of more importance which you might suggest, but these are the most prominent as viewed from my side of the elephant.

Keeping Store in a Country Town and a Few Suggestions on Advertising.

E. T. Davies, Churchs Ferry, then read the following paper:

I do not think any one can go by any set rule, but by keeping an eye on every one else one can draw some good ideas. To advertise in a paper at home we must watch what is in season and not try to imitate some other person's ad. because it takes the eye. I have often seen ads. in a paper very similar, one from a Hardware store and another from a Harness shop, and have seen them side by side for three months, until the bills are presented, and then they are changed and left for three more months. This is throwing money and business away. I am going to try and give you a few ways of drawing trade without advertising, ways that will give the catalogue houses a chase.

VISITING CUSTOMERS.

Try and find out what your trade intends to do in the way of improvements during the season, and the best way to do that is to call on them. This can be done with very little expense. You can call on many of them during the winter. If you make the suggestion in their presence they will tell you if you name a day they will send their team after you and bring you home again. I have been out four or five times this winter on such trips and have gathered some valuable information, and know just what Hardware to place most conspicuously. When on these trips don't sit down and play whist, tell stories, eat a good meal and go home uncomfortable, but take a chase around the barns and stables, the house, the cellars, &c., and see what they are doing. Look for Rope and Hay Fork, see what kind of Pulleys they use and get informed. See if there is a good gutter on the house; see if there is a cistern, or if the farmer has a Pump; find out if it is a good well or whether he is going to dig a new one, and whether he is going to use Buckets, until he gets able to buy a Pump. He may not know that you carry them in stock, and you can place them in the store so

that he can see them handily; otherwise he will find them in a catalogue, and you will lose the sale. This plan was suggested to me by traveling salesmen, who, if they are good ones and onto their jobs, always look over your little store, and when they open their catalogues always show you something not in sight, but a seasonable article at that. To be sure, if one visited all of his customers it would take up the greatest part of his time, but I must say that it is wonderful how many you can visit if you try. And be sure and take the woman with you if you have one.

HOW TO GET PEOPLE TO COME TO YOUR PLACE OF BUSINESS.

I have used several different means. I rented a cheap piano and placed it in the room at the rear of the store, and the music teacher gave lessons there three days a week. This brings the ladies and children in, and also the men. Then I use my shop for an attraction, and there is hardly a spare moment that I have not got something new to show. Last summer, as an illustration, I made a dragon from galvanized iron. This so amused the old vikings that for two or three days there were any number of visitors to see it, and all of them tried to find as much fault with it as possible, nearly every one finding some piece of Hardware he needed at home at the same time, and I found it a paying investment. You who have no shops can find some way of getting something new to show your friends and customers, and I am sure you will find no end of success in doing so.

ANOTHER VERY UNIQUE WAY OF ADVERTISING

is to build a table for summer use and take one of every article in the store that will not be spoiled and fasten it to the table by wiring or with screws and set the table outside the door when convenient. This will show very nearly your entire stock. Of course, if you have a large show window this is not necessary, but most show windows in country stores are very limited, and when winter comes it would take a 90 horse-power engine to keep the frost off of them. There is an old way of making an advertisement that you can see in every town in the country, and that is to set a Washing Machine, a few Pails and a few Forks and Shovels outside. This helps some in these lines, but they are not money makers—it's the little articles that make the profits.

I am not here to make you tired or to use up your time in idle talk, so I will leave you to think over these few suggestions and hope you may find something that will interest you and do you some good in the way of making your business more of a success in the future that you have had any idea of.

THE NEW OFFICERS.

Before the election of the new officers, Fargo was selected as the location for the 1905 convention, to be held during the month of January on dates to be selected later. The report of the Committee on Nominations was adopted without discussion. The following officers were elected for the ensuing year:

PRESIDENT, H. F. Emery, Fargo.
FIRST VICE-PRESIDENT, G. W. Wolbert, Bismarck.
SECOND VICE-PRESIDENT, A. C. McNiven, Langdon.
THIRD VICE-PRESIDENT, J. B. Buck, Rugby.
EXECUTIVE COMMITTEE, W. H. Pinkerton, Lakota.

At a meeting of the Executive Committee, which is now composed of H. F. Strehlow, Casselton; E. E. Elliott, Sanborn, and W. H. Pinkerton, Lakota, C. N. Barnes, who has been secretary of the association since its organization, seven years ago, and to whose efforts much of the success of the organization is due, was re-elected secretary. H. T. Helgesen, Milton, was elected treasurer, to succeed W. H. Pinkerton, who was elected to a place on the Executive Board.

Messrs. Emery, Strehlow and Barnes were chosen as delegates to the annual convention of the National Association in March at Indianapolis.

RESOLUTIONS.

The report of the Committee on Resolutions was adopted without change, as follows:

As members of the Retail Hardware Dealers' Association in convention assembled and about to close this, the seventh, and in many respects the best session that we have enjoyed together, we wish to express our appreciation to those who have contributed to our entertainment or profit in any way.

We wish first to assure the people of Grand Forks that they have abundantly succeeded in providing entertainment for the social sessions of the convention.

We thank the press for the full and accurate reports of the sessions of the convention.

We especially appreciate the efforts made by the manufacturers and jobbers to be present at our meeting and for the free and open discussion of the topics vital to the interests of manufacturers, wholesalers and retailers, and we cordially invite them to be present at each of our annual gatherings.

We would not forget the traveling men who have assisted as an "introduction committee" and have in many other ways contributed to the comfort and pleasure of the Hardware fraternity.

We would not forget to send our greetings to our former president, H. N. Joy, expressing regrets that considerations of health or business have caused him to remove from our State. We wish him success in the community in which he decides to locate and assure him of our continued interest in him and his family.

Before we close our labors here, we wish to extend our heartfelt sympathy to one who was prevented from meeting with us by the loss of his life companion. To many of us T. G. Walther of the Hackett, Walther, Gates Hardware Company is classed as a personal friend, as well as one with whom we have business relations. We wish him to feel that he has the sincere sympathy of the members of this convention.

To those who have assisted our secretary by their patronage of the advertising department of our Annual Programme, we would return our gratitude, as this, in a material way, is of direct benefit to us.

We extend our thanks to any and all who have prepared papers which have been presented before the association.

In view of the efforts that are being made to get through our Congress a measure known as the Parcels Post bill, the result of which would materially add to the burdens of the postal department, therefore be it

Resolved, That the North Dakota Retail Hardware Dealers' Association is unalterably opposed to the bill before Congress known as the Parcels Post bill.

We regard it as detrimental to the general interests of the people of the country. Such legislation is a direct blow at the thousands of smaller towns and business communities which have been and are an important feature in the development of the United States. We urge members of the Congress to work against and vote against this measure.

Closing Session.

The Question Box was the feature of the closing session, which was entirely devoted to it. It attracted more than the usual amount of attention. Questions on almost every variety of subjects of interest to the retail Hardware merchants were asked, and some time was taken in answering the queries, leading merchants of the State being called upon to give opinions on many of the points thus brought up.

Members Present.

The following members of the association were in attendance:

S. D. Bostwick, Bathgate.
A. A. Stenehjan, Mayville.
F. A. Argne, Hamilton.
A. C. McNiven, Langdon.
Oscar Greenland, Buford.
Joseph Larmour, Larimore.
George Larmour, Larimore.
W. W. Jamieson, Wahpeton.
C. J. Mastrud, Hatton.
C. M. Adils, Bathgate.
Hillis Kyle, Rolla.
R. F. Burger, Inkster.
K. G. Adams, Cavalier.
I. L. Neugard, Grafton.
H. M. Myhra, Davenport.
L. J. Theroux, Omemee.
D. J. Nero, Bottineau.
H. T. Connolly, Wahpeton.
J. F. Whyte, Wahpeton.
H. F. Emery, Fargo.
N. Halverson, Northwood.
R. L. Scott, Jamestown.
G. U. Mockrud, Galesburg.
O. A. Gallup, Edgeley.
J. S. Cole, Lisbon.
G. W. Wolbert, Bismarck.
H. J. Hellekson, Fairmount.
H. F. Strehlow, Casselton.
S. F. Waldo, Crystal.
E. T. Davies, Churchs Ferry.
P. A. Kloster, Hatton.
Paul N. Allen, Jamestown.
Fred. J. Kjorlein, Westhope.
S. W. Bond, Ray.
Albert Sorg, Inkster.
A. H. Schutt, Wahpeton.
W. R. McIntosh, Bottineau.
Thomas Waldie, Dickey.
J. H. McCollom, Hope.
W. H. Pinkerton, Lakota.
O. I. Butler, Clifford.
L. Thompson, Northland.
H. T. Helgesen, Milton.
Peter E. Nelson, Cooperstown.
U. S. Conn, Fargo.
O. T. Ellestad, Grand Forks.
Albert Arnegard, Hillsboro.
O. P. Oleson, Sheyenne.
W. E. Adams, Hannah.
Arne Luckman, Aneta.
K. G. Adams, Cavalier.
Peter Ottinger, Oriska.
Elmer E. Elliott, Sanborn.
John R. Vistre, Drayton.
E. D. Booker, Pembina.
George Hill, Ardoch.
F. M. Middleton, Manvel.

Manufacturers and Jobbers.

The following representatives of manufacturing and jobbing interests were present:

F. H. Young, Hackett-Walther-Gates Hardware Company, St. Paul.
F. M. Wolf, Plumbers' Supply Company, Minneapolis.
B. F. Miller, Hackett-Walther-Gates Hardware Company, St. Paul.
F. W. Fisher, T. L. Blood & Co., St. Paul.
R. A. Grim, Michigan Stove Company, Chicago.
C. D. Britton, Malleable Steel Range Company, South Bend, Ind.
J. G. Widman, Hall-Robertson Hardware Company, Fargo
E. A. Campbell, Minnesota Stove Company, Shakopee.
A. Y. Soule, Kelley How-Thomson Company, Duluth.
G. E. Hall, Hall-Robertson Hardware Company, Fargo.
Horace M. Hill, Janney, Semple, Hill & Co., Minneapolis.
H. D. Final, Marshall-Wells Hardware Company, Duluth.
R. A. Webster, Marshall-Wells Hardware Company, Duluth.
John J. Dalton, Stowell Mfg. & Foundry Company, Milwaukee.
J. S. O'Gorman, National Lead Company, Minneapolis.
H. S. Brooks, Peninsular Stove Company, Chicago.
A. D. Baughman, Janney, Semple, Hill & Co., Minneapolis.
E. J. McCormick, Konantz Saddlery Company, St. Paul.
T. J. Duffy, Jr., Germer Stove Company, Chicago.
K. A. Klinsman, L. J. Mueller Furnace Company, Milwaukee.
E. W. Eisenhart, Hibbard, Spencer, Bartlett & Co., Chicago.
E. M. Dyar, Western Oil Company, Minneapolis.
L. A. Norton, Roberts Heating & Ventilating Company, Minneapolis.
Charles S. Pierce, Marshall-Wells Hardware Company, Duluth.
S. E. Pierce, Marshall-Wells Hardware Company, Duluth.
George W. Welles, Kelley-How-Thomson Company, Duluth.
R. A. Kirk, Farwell, Ozmun, Kirk & Co., St. Paul.
T. F. Barbour and R. B. Nixon, Minneapolis branch E. C. Atkins & Co.

CONVENTION NOTES.

E. C. Atkins & Co., manufacturers of Saws of all descriptions, Indianapolis, Ind., had a nice display of Saws at the Hotel Dacotah. T. F. Barbour, manager of the Minneapolis branch of the firm, was in charge, assisted by R. B. Nixon, traveling representative. They gave out a very pretty souvenir in the shape of a watch fob with a Circular Saw as a charm.

The Marshall-Wells Hardware Company, Duluth, had a display of Niagara Stoves and Ranges, nicely arranged.

F. K. Berry, representing the National Stove Company, Lorain, Ohio, made a display of Insurance Gasoline Stoves.

The National Cash Register Company, with H. B. Ashelman, Fargo, in charge, made a display of Registers.

The White Lily Washing Machine Company, Davenport, Iowa, had a display, and gave away paper lilies of much beauty as souvenirs.

Cribben & Sexton Company, Chicago, exhibited a line of Universal Stoves and Ranges, in charge of L. W. Turnbull, Minneapolis.

The Malleable Steel Range Mfg. Company, South Bend, Ind., were represented by C. D. Britton, who had a fine display of the company's products.

E. A. Campbell was in charge of a display of Stoves of all kinds manufactured by the Minnesota Stove Works, Shakopee, Minn.

John Kuske, representing Farwell, Ozmun, Kirk & Co., St. Paul, exhibited a line of Favorite Stoves and Ranges.

Terry McCosker exhibited the Paragon Washing Machine for McDonald Bros., Minneapolis, Northwestern distributers.

George T. Adams, representing the P. D. Beckwith Estate, Dowagiac, Mich., had a line of Round Oak Stoves, Ranges and Furnaces on exhibition. Mr. Adams gave away steins carrying a handsome picture of Doe-wah-jack.

The "Hardware Dealers' Reference Book," compiled under the auspices of the association, was distributed at the convention. It is a book containing nearly 200 pages and is designed for use by the membership throughout the year. In it are incorporated a number of the latest standard lists of Hardware and related lines, various tables and other information of value to merchants. It also contains the programme of the convention, the names of the officers of the association and a list of the Hardware merchants of North Dakota. Perhaps the greater part of the book is occupied by advertising from manufacturers and jobbers, who have been very generous in this respect. The book is certainly a credit to the association and is well worth preservation at the hands of the members.

AMONG THE HARDWARE TRADE.

Miller Hardware Company, Olean, N. Y., who have for some time felt the need of larger quarters, have leased the commodious Conkling furniture store, which will give them the required space. They will occupy the lower floor and all of the upper floors formerly used by Mr. Conkling, together with the Conkling and Miller warehouses in the rear. Mr. Conkling has closed out his wall paper and carpet departments, and has disposed of his furniture business to the Miller Hardware Company, who will continue this line in connection with those formerly handled.

Hurrel & Mehaffey have bought the Hardware, Stove and Agricultural Implement business of Corbin & Bowhay in Liberty, Neb.

W. H. Worden has disposed of his interest in the Hardware firm of Keezel & Worden, Garnett, Kan., and the style is now Keezel & Craig.

The Hearn & Greene Hardware Company, Eatonton, Ga., have just been incorporated, succeeding Hearn & Greene, dealers in Hardware, Wagons, Buggies, Harness, Sash, Doors, furniture and lumber. T. G. Greene is president of the new company, and L. M. Pennington, secretary and treasurer.

Bryan Hardware Company, Galveston, Texas, have disposed of their business to Boddeker & Lyons, who will continue at the old stand. The members of the new firm have previously been connected with the Bryan Company, Mr. Boddeker as secretary. Guy M. Bryan, president of the company, and also of the Sour Lake Hardware Company, Sour Lake, Texas, has sold his interest in both concerns after 15 years of service in this line, and has become actively identified with the Galveston National Bank.

Phillips, Yarbrough & Allen have bought out the stores formerly conducted by L. F. Dickson and T. C. Pinckard, in Opelika, Ala., and will continue the wholesale and retail business in Hardware, Stoves, Crockery, Mill and Plumbing Supplies.

S. C. Monson has disposed of his interest in the Hardware business at Hanlonton, Iowa, to his partner, and the style is now O. H. Myli & Son.

S. F. Saxton and Fred. Saxton have purchased the Hardware store of the S. K. Northam Estate, Traverse City, Mich., from A. H. Perry, and will continue the business under the style of S. F. Saxton Hardware Company. In the near future they are expecting to make a number of improvements in the establishment.

J. H. Roberts has sold his Hardware, Stove and Tinware business in Addison, N. Y., to Fuller & Filer.

Chas. W. Lord & Sons, dealers in Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c., Dover, Del., have been succeeded by Dover Hardware Company.

Henry Muller has succeeded Iblings & Leister in the Hardware, Stove and Sporting Goods business in Parkersburg, Iowa. Mr. Muller will add Paint and Oils to the lines formerly carried.

Greentown Hardware Company, Greentown, Ind., have been incorporated with a capital stock of $10,000. They will do a retail business in Hardware, Stoves, Tinware, Farming Implements, Paints, Sporting Goods, Buggies, Harness, &c.

Walker & Barker, Hardware merchants, Waverly, Ky., have been succeeded by Barker Bros.

Hansen Bros. & Co., Hardware and Implement merchants, and A. F. Schwartz, Harness dealer, Hildreth, Neb., have consolidated their interests under the style of Hansen Bros. Company, a corporation, with a capital of $20,000.

W. A. Newbold has succeeded Shire Hardware Company, Oblong, Ill.

Curtwright Bros. have bought Jno. A. Wilson's Hardware, Stove, Farm Implement and Wagon stock in Holliday, Mo., and will continue at the old stand.

L. E. Anthony has disposed of his Hardware and Stove business, at Manilla, Iowa, to Denny & Hockett.

The Creek & Heldt Company, Oakland City, Ind., have been incorporated with a capital of $12,000. They are successors to the Hardware Stove and furniture business formerly conducted under the style of Creek & Heldt.

The Crete Mercantile Company have succeeded M. E. Haight in the Hardware and general manchandise business in Crete, Neb.

Fritz Luckenbach is successor to Fritz Luckenbach & Co. in the Hardware, Mill Supply and Vehicle business in Menardville, Texas.

Curtright Bros. have succeed John A. Wilson in the Hardware business in Holliday, Mo.

E. C. Burrows has bought the Fryslie & Elliott Hardware stock in Clarion, Iowa.

Gate City Hardware Company, Gate City, Va., have been succeeded by Quillen, McConnell & Co.

Wike & Davis, Barry, Ill., have dissolved. N. R. Davis continues at the old stand.

Jas. F. Harris has disposed of his Hardware business in Maron, Ill., to W. S. Ames & Bro.

Buchtel & Rich, Hardware and Machinery dealers, St. Edwards, Neb., have been succeeded by Rich Bros.

Harris & Rogers Bros., Hardware, Stove, Tinware and Agricultural Implement dealers, Newmarket, Iowa, have been succeeded by Rogers Bros.

Husted & Megrew are successors to L. P. Husted in the Hardware, Farm Implement and Buggy and Wagon business in Greencastle, Mo. The new firm have made a number of improvements in their establishment.

The Day-Lindsey Hardware Company, Omro, Wis., have been succeeded by F. Gensch & Son, formerly of Manitowoc.

Canning-Churchill Company, Spring Valley, Wis., have been incorporated, with a capital stock of $25,000. They will carry on the retail business in Shelf and Heavy Hardware, Stoves and Tinware, Paints and Oils, Sporting Goods and Lumber.

MISCELLANEOUS NOTES.

Britelite Acetylene Lamp.

The Britelite Lamp Company are occupying the factory on Pond Hill, Winsted, Conn., which has been renovated and improved until it is now a modern plant. They will manufacture the Britelite acetylene lamp, in which the carbide in powdered form is admitted automatically to the water reservoir where the gas is formed, and only as needed to procure the necessary supply of gas at a low pressure, rendering it perfectly safe, it is claimed.

Corkscrews.

The Rockwell Clough Company, Alton, N. H., manufacturers of corkscrews, have recently moved into a larger plant, and are now in a position to satisfy the demand for their wire corkscrews more promptly than heretofore. Their output last year exceeded 30,000,000 corkscrews, from the smallest to the largest size, which were shipped to all parts of the world. Their corkscrews are all made by automatic machinery of the most improved type, the result of more than twenty-five years of study by the inventor and manufacturer. Their corkscrew known as the Newire, it is stated, will do all the work required of it in the home, and can be sold at a low price. It has a solid wood handle and a steel wire screw. It is provided with a button stop at a convenient distance from the point of the screw. Each corkscrew has a wooden cap that fits over the screw when not in use, preventing the point from becoming dull or scratching other articles.

Handy Combination Vise.

The Bloomfield Mfg. Company, Bloomfield, Ind., sell through the hardware trade a combination tool called the Universal repair machine. It is a vise, anvil, drill and hardy, and has tool grinder, pipe clamp, harness clamp and shoe last attachments. It is made in various weights from five pounds up to 45 pounds.

The Diamond Carpet Stretcher.

The Diamond carpet stretcher, manufactured by the Holliday Mfg. & Engineering Company, 200-202 South Clinton street, Chicago, Ill., has a hardwood head in which are steel points to engage in the carpet. A notched steel bar 12 inches long passes through a slide on the top of the wooden head. The opposite end of the bar is bent at an angle, with a sharp point to be driven into the floor. The stretcher is operated by turning a crank on the top of the slide, which is so arranged as to draw the head toward the sharp point of the bar, thus stretching the carpet. The stretcher holds the carpet in such position as desired, wherever the crank is stopped, without the crank being held or fastened, admitting of the free use of both hands by the operator to adjust and tack down the carpet.

Superior Brass Hose Couplings.

J. R. Clancy, Syracuse, N. Y., has begun the manufacture of brass couplings for water and steam hose. The couplings are molded with the latest improved molding machines, and finished in the best special tools. There are six sizes for water hose, from ½ to 2-inch; and two sizes, ¾ and 1-inch, for steam hose.

Bronzene.

John Briggs & Co., 14 and 16 Washington street, Boston, Mass., are putting on the market Bronzene, which is referred to as a natural green oxide, imported and controlled by them, prepared by their own special process and ground in absolutely pure linseed oil. The covering capacity and durability of this bronze green are emphasized by the manufacturers, who refer to it as being very desirable for painting all surfaces exposed to the elements, such as blinds, front doors, store fronts and fences. It is produced in three clear shades, light, medium and dark, and is put up "ready for the brush," as well as in paste form. John Briggs & Co. are also manufacturers of a full line of paints, and have just completed a large, brick factory, equipped with the latest improved machinery. It is of slow burning construction and is provided with sprinklers, &c. Their location is one of the best along the water front, all their raw materials coming direct by water to the factory.

The Roseland Bread Toaster.

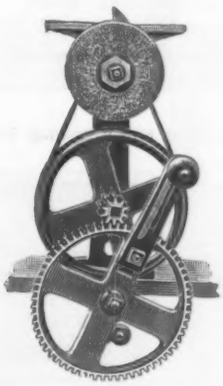
The distinct feature of the toaster shown in the accompanying cut is the hollow bars upon which the bread rests when being toasted. These are constructed so that air may circulate between them and the base plate, to avoid burning the bread, as the bars do not become over-

The Roseland Bread Toaster.

heated. The toaster is made to prevent the gases from the fire passing through the bread, and so the toaster may be used on any stove, and over gas, gasoline, oil, wood or coal fires. The device is manufactured by the Rockford Can Company, Rockford, Ill.

Schofield's Perfect Tool Grinder.

Schofield & Co., Freeport, Ill., are placing on the market the tool grinder illustrated herewith. The emery wheel is 4 x ¾ inches, and makes 2500 to 3500 revolutions



Schofield's Perfect Tool Grinder.

per minute. The makers state that any tool can be ground any bevel desired by raising or lowering the rest. The scissor rest at the top of the wheel holds scissors to be ground the right bevel. The grinder weighs 8 pounds and is recommended for family, carpenter, butcher, hotel and restaurant use.

Best Yet Knife Sharpener.

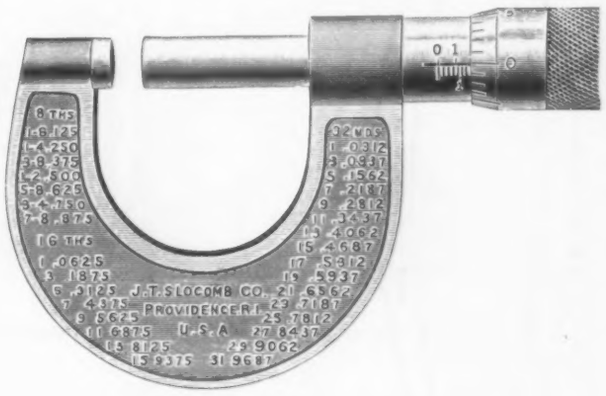
F. H. Smith Mfg. Company, 18-30 West Randolph street, Chicago, Ill., are offering the knife sharpener shown herewith. It is made of nickel plated steel

Best Yet Knife Sharpener.

throughout, is provided with a hard wood handle, and does not have to be clamped or screwed down. In operation the sharpener is held firmly by the left hand on any flat surface, and with the right hand the knife is inserted in the slot. The knife is pressed gently between the cutters and drawn toward the operator from heel to point, resulting, it is stated, in a smooth, keen edge.

Polished Pressed Steel Micrometer.

The accompanying cut represents a micrometer with a polished frame and full table of decimal equivalents; the table of sixty-fourths being on one side, and eighths, sixteenths and thirty-seconds on the other. These figures are raised instead of being sunk, this being accomplished in a hydraulic press, a pressure of about 300 tons being used, which compresses the steel and stiffens the frame. The raised figures and ribs about the edges are referred



Polished Pressed Steel Micrometer.

to as making a better finger hold than when the frame is flat and the figures are sunk. The figures are alluded to as being very distinct, and, on the whole, as presenting a very neat appearance. All other features of the tool are the same as the manufacturer's regular micrometer. The tool illustrated is at present made in one size only, measuring from 0 to 1 inch. It is being put on the market by J. T. Slocomb Company, Providence, R. I.

Samson Boiler Tube Brushes.

Nafew & Gelston, 453 Canal street, New York, are making at their factory in Brooklyn the Samson patented boiler tube brushes, here illustrated. The distinguishing

Fig. 1.—Samson Wire Boiler Tube Brush.

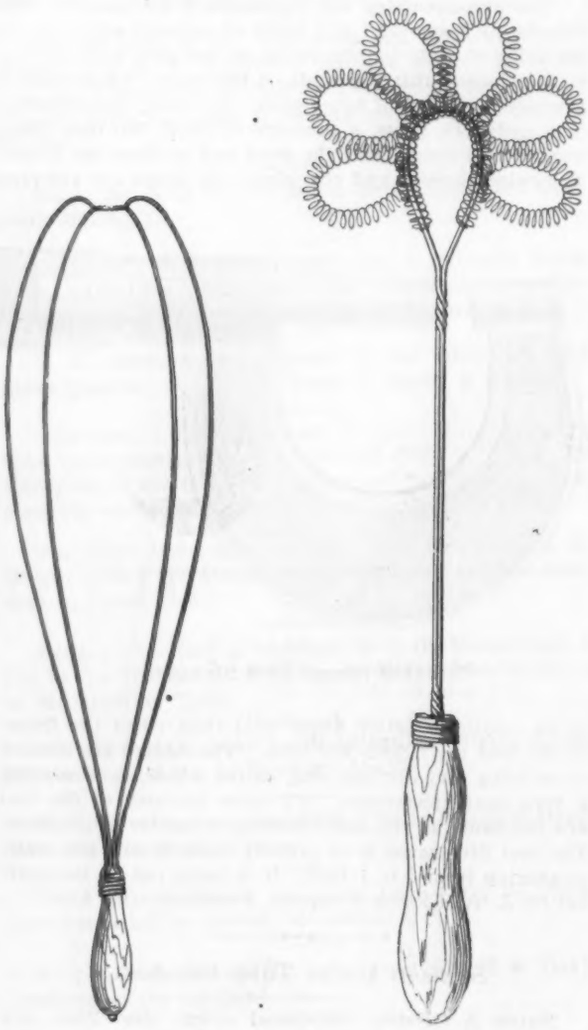
feature of the brush is indicated in Fig. 2, the double steel center having a patented knob on top which prevents untwisting or unraveling, and a solid steel socket, threaded for iron pipe, riveted securely to the steel center, instead of being pinched or welded. The stock is referred to by the manufacturers as of finely tempered spring steel wire,

Fig. 2.—Sectional View of Steel Center.

very elastic, highly resistant and not liable to bend, break or crush. The brushes are made in plain steel wire, steel wire tinned and brass wire, 1 to 6 inches inclusive in diameter.

Carpet Whips.

The Western Wire Goods Company, Buffalo, N. Y., manufacturers of wire goods, are placing on the market something new in the line of carpet whips, as shown by the accompanying cuts. The pattern styled Buffalo is made of four strands of spring wire, interlocked at



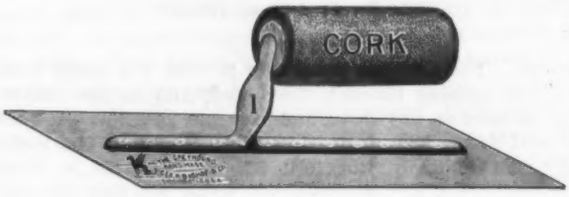
Buffalo. Perfection.

Carpet Whips.

the upper end; two of which, twisted, pass through the wood handle and are clinched on the outside; the other two are coiled around the inner end of the handle, forming a ferrule and giving proper elasticity, which is referred to as an entirely new combination. The Perfection is of coiled wire, coiled on a central beater head or frame; and owing to the fact that there is no outside ring or frame, it is explained that much greater elasticity is obtained than would be the case if a more rigid frame were used; and at the same time the construction is such that great durability is insured.

The Greyhound Cork Handle Plastering Trowels.

Geo. H. Bishop & Co., Lawrenceburg, Ind., are offering the line of plastering trowels shown in the accompanying cuts. The trowels are hand made, and their hang is referred to as light and true. Every feature of the trowels has been given careful study in quality, style, utility and workmanship. The handles are made of tough compressed cork, with wooden core extending through the center to firmly fasten it to mounting and enable it to withstand the most severe usage. The following points of excellence of the cork handle are alluded to: That cork, being light and pleasant to the touch, clings slightly to the hand; that it requires less grasping strength and reduces the strain on hand, wrist and arm, and that it absorbs the moisture of the hand, yet remaining dry. The handles are all uniform and can be fitted by removing the screw at the end of the mounting. The shank of the mountings has a slight crook, or bend, leaning slightly toward the rear, while the rear end of the cork handle has a slight elevation of about 1-16 inch, to make it balance perfect and true. It is remarked that as the trowel is often guided by the forefinger, the manufacturers have not overlooked this feature, but have made that feature perfect and comfortable. The blades of the finishing trowel only are about 23 gauge, 4½ inches wide. They are described as being well hammered and blocked absolutely true. They are dished slightly from the center to the edges and extend about 1 inch at each end beyond the mounting. They are countersunk riveted at each inch



Finishing Trowel Only.

Finishing and Browning Trowel.

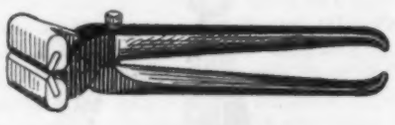
Browning Trowel Only.

The Greyhound Cork Handle Plastering Trowels.

to enable them to spring freely to suit the work at hand. The blade of the finishing and browning trowel is about 21 gauge, 4¾ inches wide, which adds body to the blade. Otherwise the trowel is made the same as the one above described. The browning trowel only has a blade about 20 gauge, 4¾ to 5 inches wide. The mounting extends the full length of the blade to make a light, strong and rigid trowel. The trowels are packed one-third dozen in a box.

Smith's Cutting Nippers.

Ira B. Smith of Bristol, Conn, is manufacturing and placing on the market the cutting nippers shown here-

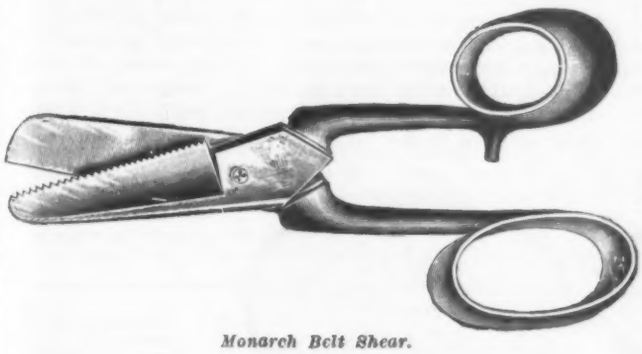


Smith's Cutting Nippers.

with. They are made of steel castings, with inserted jaws, which are made of the best quality tool steel, carefully tempered and ground. Whenever these jaws become dulled by use they can be removed by driving from the end and replaced after being ground, or new jaws can be inserted. The nippers are now made in 8 and 10 inch sizes.

Monarch Belt Shear.

Joseph F. McCoy Company, 157 Chambers street, New York, are offering the shear shown herewith, made in 9-inch size, with polished blades and japanned handles.

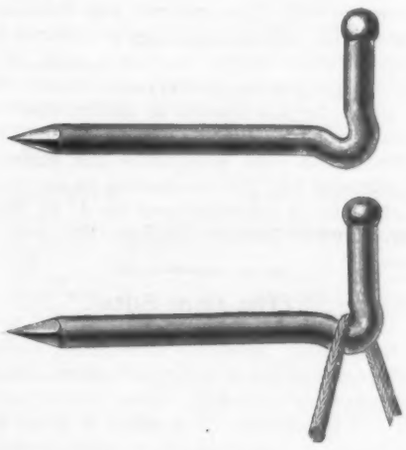


Monarch Belt Shear.

It is designed for cutting leather, rubber and linoleum, being especially adapted to cutting corners, circles, &c., in linoleum.

Wire Drive Hooks.

The Wire Goods Company, Worcester, Mass., are putting on the market a line of drive hooks, as shown in accompanying illustrations. These hooks have a center



Wire Drive Hooks.

drive for use with a hammer and a drop bend to prevent a picture cord or whatever else may be hung upon it from slipping back against the wall.

Electric Vest Pocket Light.

The American Electrical Novelty & Mfg. Company, 304-314 Hudson street, New York, are offering the Ever Ready vest pocket light here illustrated. It is especially serviceable for doctors, bank employees in entering vaults, plumbers, &c., in magazines or hazardous places of any kind, as well as for tourists or travelers, as it can be

Ever Ready Vest Pocket Light.

placed under the pillow for instant use. It is very compact, weighing but 7 ounces and measuring, over all, 3⅜ x 2⅝ x 15-16 inches. The body is black with ends of nickel plated brass. In one end is an electric light bulb with reflector and bull's eye lens, the light being supplied by two cylindrical dry batteries, the necessary circuit being closed by pressing the push button, as shown. This device gives a generous light, the batteries being renewable at nominal cost, and easily obtained from any of a large number of depots handling their goods, of which there is a large line of the same general character.

Ball Bearing Lock Cylinders.

The New York Lock Company, Branford, Conn., represented at 117 Chambers street, New York, by J. N. Limeburner, have put on the market an improved form of ball bearing lock cylinders, as here shown, used in connection with their various lines of locks for front or store door

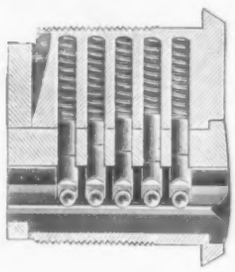


Fig. 1.—Sectional View of Cylinder.

Fig. 2.—Showing Angle in Key Plug.

and vestibule sets, night latches, dead locks, &c. Fig. 1 is a sectional view of a cylinder, showing the ball bearing pin tumblers, Fig. 3 being another view with the key inserted so as to bring the pins in line to revolve the key plug. An important feature in this construction is the method of recessing the steel balls, as seen in Fig. 4, instead of a square or flat end pin against the ball. Another

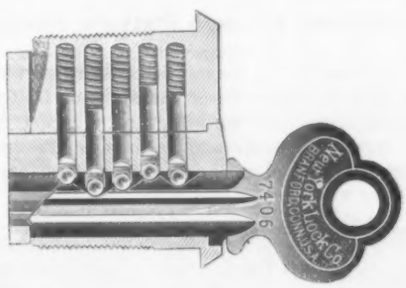


Fig. 3.—Cylinder with Key Inserted.

noteworthy characteristic is that the grooves or notches of the key, which is of German silver, milled, not pressed, are cut from full stock in the bitted surface, making the key especially strong at this point and reducing the tendency to breakage in the cylinder. Another detail is

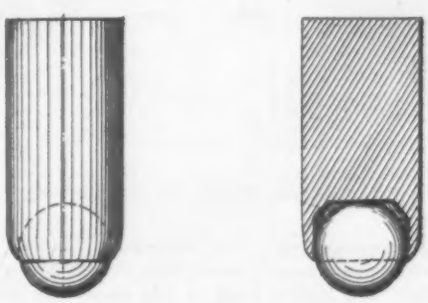


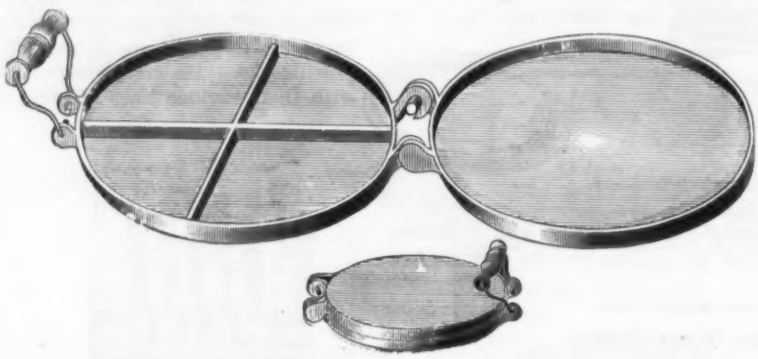
Fig. 4.—Enlarged Views of Pins and Balls.

in the peculiar shape of the keyway in the plug, by means of which the pin tumblers fall at an angle instead of perpendicularly, thus increasing greatly the difficulty of using the finest pick under more than one or two of the five tumblers at a time, if not making it impossible,

as the company assert. This feature is partially indicated in Fig. 2. These locks are particularly recommended by the manufacturers for hotels, offices, studios, flat houses, apartments, or any place where security is the first consideration, while the price is no higher than ordinary cylinder work of good grade.

New Idea Hot Cake Iron.

Herewith illustrated is a hot cake iron put on the market by the Franklin Specialty Company, 807-809 Cherry street, Reading, Pa. The utensil is made of high grade iron castings, japan finished on the outside. It is

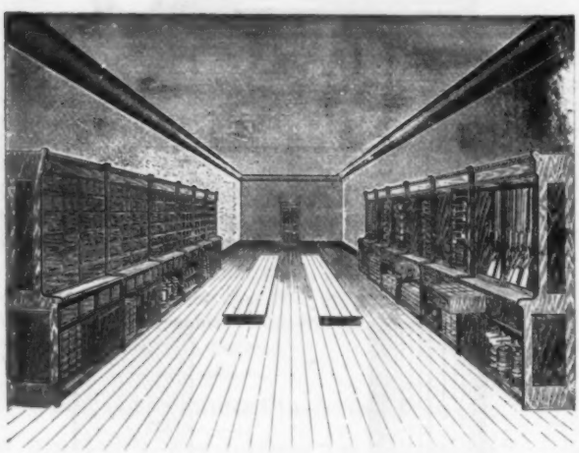


New Idea Hot Cake Iron.

provided with an enameled wood handle mounted on heavy copper plated wire, and an interchangeable hinge of new pattern, which works freely, making the turning of the iron especially easy. The iron is readily taken apart for cleaning. The weight of the utensil is 3 pounds 3 ounces, and the diameter when closed is 7 inches, the hight being 1¼ inches. The iron is recommended as a valuable addition to the kitchen for cooking all kinds of cakes made of batter, such as buckwheat cakes, waffles, corn fritters, &c.

The Warren Chicago Pattern Shelving.

The shelving shown herewith consists of sections for either 25 feet on each side of the store or 50 feet on one side. It comprises the manufacturers' latest designs in shelving, combining base and cabinet, made in units so as to allow of perfect arrangement and adjustment, according to wall space or the demands of stock. The sections correspond in size, being 85½ inches high, 51 inches wide and 15⅝ inches deep in the upper portion and 20 inches at the base, to permit the shelving to be arranged or added to at any time with the assurance that the additional cabinets will fit perfectly. The outfit is referred to as being complete in every respect, and contains all the different styles made in the Chicago Pattern Series, the workmanship being equal, it is stated, to any shelving produced by the company. This series has been made to meet a popular demand for a practical every day, up to date style of shelving for hardware stores, the price being alluded to as less than could possibly be made by any planing mill or home carpenter for shelving of similar form. Each section is described as having the choicest white oak exterior, with soft wood, usually poplar, interior, covered with high grade varnishes and made with the same care as the company's higher priced shelving. All the drawers are made with raised bottoms and of wood throughout, experience having shown, it is remarked, that metal drawers buckle, bulge and scrape, thus making their operation difficult, while contact with these surfaces causes injury to the sharp points of tools, such as bits, augers, chisels, &c. If the entire equipment is not desired, illustrations of individual cabinets will be sent on request. The cabinets are finished complete, ready for service the moment they are placed in position. The manufacturers explain that this outfit is made at a price within the reach of every merchant; that it provides a place for all classes of goods; that it adds to the beauty of a store; that its appearance will draw additional trade, and that experience has shown that the Warren cabinets pay for themselves in one year.



The Warren Chicago Pattern Shelving.

The shelving is manufactured by J. D. Warren Mfg. Company, Masonic Temple, Chicago, Ill.

The Gem Sifter.

The Gem sifter, herewith illustrated, is intended to supply the demand for a high-grade sieve, combining the essential points of a dredger, sifter, mixer and a washer for fruit and vegetables. The sifter is made from heavy tin plate, wired in the upper rim to make it rigid and substantial. The agitator can be lifted out when it is desired to use the device simply as a washer. The flaring form of the body and the removability of the agitator make it possible to nest the sifters closely for shipment. One dozen of the sifters are packed in a heavy pasteboard carton, somewhat smaller than the No. 8 tea kettle carton. The sifters are made by the J. L. Clark Hardware Company, Rockford, Ill.

The Gem Sifter.

The Long Beach Hardware Company, Long Beach, Cal., have been incorporated with a capital stock of $25,000, of which $15,000 has been subscribed. T. H. Brown is president, and J. E. Carter, Jr., secretary and treasurer.

Current Hardware Prices.

REVISED FEBRUARY 2, 1904

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued June, 1903, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Abrasives—

Adamite in Carloads:
Crystal ... ℔ ton $90@100
Grain ... ℔ ton $120@140
See also *Emery.*

Adjusters, Blind—

Domestic, ℔ doz. $3.00 ... 33⅓%
North's ... 10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent ... 35%
Tapiin's Perfection ... 35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Armand Hammer, Wrought ℔ lb 8½@8¾c
Buel Patent Trenton ... ℔ lb 9½@9¾c
Eagle Anvils ... ℔ lb 7¾@7¾c
Hay-Budden, Wrought ... 9@9¼c
Horseshoe brand, Wrought ... 9@9¼c

Imported—

Peter Wright & Sons ... ℔ lb 10½c

Anvil, Vise and Drill—

Millers Falls Co., $18.00 ... 15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co ... 30&5%

Augers and Bits—

Com. Double Spur ... 70&10@75%
Boring Machine Augers ... 66⅔@70%
Car Bits, 12-in. twist ... 60@60&10%
Jennings' Pattern ... 50&10&5@60%
Ford's Auger and Car Bits ... 40&5%
Forstner Pat. Auger Bits ... 25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list 25&10%
No. 30. R. Jennings' List. 40&7½&10%
Russell Jennings ... 25&10&2½%
L'Hommedieu Car Bits ... 15&10%
Mayhew's Countersink Bits ... 45%
Millers' Falls ... 50&10&5%
Pugh's Black ... 20%
Pugh's Jennings' Pattern ... 35%
Snell's Auger Bits ... 60%
Snell's Bell Hangers' Bits ... 50&10%
Snell's Car Bits, 12-in. twist ... 60%
Wright's Jennings Bits (R. Jennings' list) ... 50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26 ... 50&10%
Clark's Pattern, No. 1, ℔ doz., $26; No. 2, $18 ... 50&10%
Ford's, Clark's Pattern ... 50&10@60%
C. E. Jennings & Co., Steer's Pat. 25&10%
Swan's ... 60%

Gimlet Bits—

Common Double Cut .. gro. $2.75@3.00
German Pattern ... gro. $4.00@4.25

Hollow Augers—

Bonney Pattern, per doz. $10.00@11.00
Ames ... 25&10%
New Patent ... 25&10%
Universal ... 20%
Wood's Universal ... 25%

Ship Augers and Bits—

Ford's ... 40%
Snell's ... 40%
C. E. Jennings & Co.:
L'Hommedieu's ... 15&10%
Watrous' ... 33⅓&10%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled ... gro. $2.75@3.00
Unhandled, Shouldered. gro. 63@66c
Unhandled, Patent ... gro. 66@70c
Peg Awls:
Unhandled, Patent ... gro. 31@34c
Unhandled, Shouldered. gro. 65@70c
Scratch Awls:
Handled, Common .. gro. $3.50@4.00
Handled, Socket .. gro. $11.50@12.00
Hurwood ... 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, factory brands ... $5.50
First Quality, jobbers' brands ... $5.00@5.25
Second Quality ... $4.50@4.75

Axle Grease—See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar ... 5@5½c
Concord, Solid Collar ... 5@5½c
No. 1 Common ... @4½c
No. 1½ Com., New Style ... 4½@5c
No. 2 Solid Collar ... 4½@5¼c
Nos. 7, 8, 11 and 12 ... 60&5@60&10%
Nos. 13 to 14 ... 60@5@60&10%
Nos. 15 to 18 ... 60&10@70%
Nos. 19 to 22 ... 60&10@70%

Boxes, Axle—

Common and Concord, not turned .. lb. 4½@4¾c
Common and Concord, turned .. lb. 5@5½c
Half Patent .. lb. 9@9½c

Bait— Fishing—

Hendryx:
A Bait ... 20%
B Bait ... 2½
Competitor Bait ... 40&5%

Balances— Sash—

Caldwell new list ... 50%
Pullman's ... 60%

Spring—

Spring Balances ... 60@60&5%
Chatillon's:
Light Spg. Balances. ... 40&10%
Straight Balances. ... 40%
Circular Balances ... 50%
Large Dial ... 30%
Peerless ... 50%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb., per lb .. 3@3½c

Towel—

No. 10 Ideal, Nickel Plate ... ℔ gro, $8.50

Beams, Scale—

Scale Beams, List Jan. 12, '82 .. 40&10%
Chattillon's No. 1 ... 30%
Chattillon's No. 2 ... 40%

Beaters— Egg—

Lightning Chain, ℔ gro ... $15.00
National Mfg. Co.: ℔ gro.
No. 1 Dover, Family size ... $7.00
No. 2 Dover, Hotel size ... 14.00
Taplin Mfg. Co.: ℔ gro.
No. 60 Improved Dover ... $6 01
No. 75 Improved Dover ... $5.50
No. 100 Improved Dover ... $7.00
No. 102 Improved Dover, Tin'd ... $8.50
No. 150 Improved Dover, Hotel ... $15.00
No. 152 Imp'd Dover, Hotel, Tin'd ... $17.00
No. 200 Imp'd Dover Tumbler ... $8.50
No. 202, Imp'd Dover Tumbler Tin'd $9.50
No. 300, Imp'd Dover Mammoth, ℔ doz. ... $35.00
Wonder (S. S. & Co.) ... ℔ gro. net, $6.00

Bellows—

Blacksmith, Standard List .. 75@75&5%

Blacksmiths'—

Inch..	*20*	*22*	*24*	*26*	*28*	*30*	Net Prices.
Each	*$3.50*	*3.75*	*4.25*	*4.80*	*5.35*	*6.15*	
Extra Length: Each	*$4.00*	*4.55*	*5.10*	*5.60*	*6.40*	*7.50*	

Molders—

Inch	*10*	*12*	*14*	Net Prices.
Doz	*$8.50*	*10.00*	*13.00*	

Hand—

Inch	*6*	*7*	*8*	*9*	*10*	Net Prices.
Doz	*$4.25*	*4.50*	*5.00*	*6.50*	*7.75*	

Bells— Cow—

Ordinary goods ... 75&5@75&10%
High grade ... 70&10@70&10&5%
Jersey ... 75&10%
Texas Star ... 50%

Door—

Abbe's Gong ... 45%
Barton Gong ... 55%
Home, R. & E. Mfg. Co.'s ... 55&10%
Lever and Pull, Sargent's ... 60&10&10%
Yankee Gong ... 35%

Hand—

Hand Bells, Polished, Brass ... 60& @60&10%
White Metal ... 60%
Nickel Plated ... 50@50&5%
Swiss ... 60@60&7½%
Cone's Globe Hand Bells ... 33⅓@33⅓&10%
Silver Chime ... 33⅓@33⅓&10%

Miscellaneous—

Farm Bells ... lb 2@2½c
Steel Alloy Church and School ... 60@60&5%
American Tube & Stamp'g Co. Gongs .. 75%
Table Call Bells ... 50@50&10%
Trip Gong Bells ... 55&10@60%

Belting— Rubber—

Agricultural (Low Grade) .. 75@75&5%
Common Standard ... 70@70&10%
Standard ... 65@70%
Extra ... 60&5@60&10%
High Grade ... 50&5@50&10%
Boston Belting Co.:
Seamless Stitched Imperial ... 45&5%
Boston ... 50&5%
Niagara ... 60&5%

Leather—

Extra Heavy, Short Lap ... 60@60&5%
Regular Short Lap 60&10@60&10&10%
Standard ... 70@70&5%
Light Standard ... 70&10%
Cut Leather Lacing ... 60&10%
Leather Lacing Sides, per sq. ft .. 18c

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender ... 40%
Green River Tire Benders and Upsetters ... 30%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.5. No. 5, $20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain ... 50%
Parts ... 50%
Spokes ... 50%
Tubes ... 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—
See *Augers and Bits.*

Blocks— Tackle—

Common Wooden ... 70&10@75&5%
Ho low Steel Blocks, with Ford's Patent Sheaves ... 50&10%
Lane's Patent Automatic Lock and Junior ... 30%
Stowell's Novelty, Mal. Iron ... 50&10%
Stowell's Self Loading ... 60%
See also *Machines, Hoisting.*

Boards, Stove—

Zinc, Crystal, &c ... 30&10@40&10%

Bolts—

Carriage, Machine, &c.—

Common Carriage .. 75&5@75&10&5%
Phila. Eagle, $3.00 list May 24, '95 .... 80&30&5%
Bolt Ends, list Feb. 14, '95 ... 75&10%
Machine ... 75&10@75&15%
Machine with C & T. Nuts .. 70&10%

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch	*3*	*4*	*5*	*6*	*8*
Per doz	*$0.26*	*.30*	*.39*	*.47*	*.65*

Cast Iron Spring Foot:

Inch	*6*	*8*	*10*
Per doz	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch	*6*	*8*	*10*
Per doz	*$0.75*	*1.05*	*1.30*

Cast Iron Shutter, Brass Knobs:

Inch	*6*	*8*	*10*
Per doz	*$0.57*	*.80*	*1.00*

Wrt Barrel, Jap'd .. 75&10@75&10&10%
Wrought " Bronzed .. 40&5@50&10%
Wrought Flush, B. K .. 50&10@60&10%
Wrought Shutter ... 40&10&10@60&5%
Wrought Square Neck ... 50@50&10%
Wrought Sunk, Flush ... 50@50&10%
Ives' Patent Door ... 60%

Stove and Plow—

Plow ... 60@60&5%
Stove ... 90&5@3&10&5%

Tire—

Common ... 72½@72½&10%
Norway Iron ... 80@80&5%
American Screw Company:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila. list Oct. 16, '84 ... 82½%
Bay State, list Dec. 28, '99 ... 72½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila., list Oct. 16, '84 ... 82½%
Eclipse, list Dec. 28, '99 ... 72½%
Russell, Burdsall & Ward Bolt & Nut Co.
Empire, list Dec. 28, '99 ... 72½%
Norway Phila., list Oct. '84 ... 80%
Upson Nut Co.:
Tire Bolts ... 72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch	*1¼*	*1½*	*1¾*	*2*
Per doz	*$4.30*	*5.00*	*5.75*	*7.25*
Inch			*2¼*	*2½*
Per Doz			*$8.65*	*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each ... 25%

Boxes, Mitre—

C. E. Jennings & Co ... 25&10%
Langdon ... 15&10%
Perfection ... ℔ doz. $ 6.00
Schatz ... 40%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American .. $1.15@1.25
Barber's ... 50&10&10@60&10%
Fray's Genuine Spofford s ... 60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 ... 60%
C. E. Jennings & Co ... 50&5&10%
Mayhew's Ratchet ... 60%
Mayhew's Quick Action Hay Patent .. 50%
Millers Falls Drill Braces ... 25&10%
P., S. & W. Co. Peck's Patent 60&10@65%

Brackets—

Wrought Steel ... 80@80&5%
Bradley's Wire Shelf:
Full cases ... 80&10&10%
Broken cases ... 80&10%
Griffin's Pressed Steel ... 80%
Griffin's Folding Brackets ... 70&10%
Stowell's Cast Shelf ... 75%
Stowell's Sink ... 50%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co ... 75@75&10%

Buckets, Well and Fire—

See *Pails*

Bucks Saw—

Hoosier ... ℔ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts— Brass—

Wrought list Sept., '96 ... 30@30&5%
Cast Brass, Tiebout's ... 50%

Cast Iron—

Fast Joint, Broad ... 50@50&10%
Fast Joint, Narrow ... 50@50&10%
Loose Joint ... 10&5@70&10%
Loose Pin ... 70&5@70&10%
Mayer's Hinges ... 70&5@70&10%
Parliament Butts ... 70&5@70&10%

Wrought Steel—

Table and Back Flaps ... 75%
Narrow and Broad ... 75%
Inside Blind ... 75&10%
Loose Pin ... 75%
Loose Pin, Bali and Steeple Tip 80&20%
Japanned, Bail Tip Butts 70&10%
Bronzed Wrt, Nar. and Inside Blind Butts ... 55&10%

Extra 10@10&10%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series ... 5%
1200 series ... 33⅓%
200, 300, 600 and 900 series ... 40&10%
Hendryx Bronze:
700, 800 series ... 40&10%
Hendryx Enameled ... 40&10%

Calipers—See *Compasses,*

Calks, Toe and Heel—

Blunt, 1 prong ... per lb .. 4@4¼c
Sharp, 1 prong ... per lb. 4¼@4¾c
Perkins' Blunt Toe ... cents, ℔ lb .365
Perkins' Sharp Toe ... cents, ℔ lb .415

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 50	2.00	2.25	each.
Iowa Pattern...	....	2.35	2.50	each.
	20	30	40	qts.
New York Patt'rn	1.65	2.40	2.75	each.
Baltimore Patt'rn	....	1.80	2.00	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.	
$48.00	64.20	129.60	gro., net

Caps—Percussion—

Eley's E. B. 60c
G. D ..... *per M* 34@35c
F. L ..... *per M* 40@45c
G. E ..... *per M* 50@53c
Musket ..... *per M* 62@63c

Primers—

Berdan Primers, $2.00 per M...30c&5%
B. L Caps (Sturtevant Shells) $2.00 per M 20%
All other primers per M.$1.53@$1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50 ..... 10c&5%
38 C. F., $7.00 ..... 10c&5%
22 cal. Rim, $1 50 ..... 10c&5%
32 cal. Rim, $2.75 ..... 10c&5%
B. B. Caps, Con., Ball Swgd *$1 90*
B. B. Caps, Round Ball *$1.40*
Central Fire 25%
Target and Sporting Rifle.....15c&5%
Primed Shells and Bullets.....15c&10%
Rim Fire Sporting 50%
Rim Fire, Military ..... 15c&5%

Cases, Show—

Sun, No. 102. Silent Salesman, 6 ft., $25.00

Casters—

Bed ..... 70@70c&10%
Plate ..... 60@60c&5%
Philadelphia ..... 75@75c&10%
Boss ..... 70c&10%
Boss Anti-Friction ..... 70c&10%
Martin's Patent (Phoenix) 45%
Smith & Hemenway Co. 33⅓%
Standard Ball Bearing 45%
Tucker's Patent low list 30%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Jobbers' Shipments:

3-16	¼	5-16	⅜	7-16	½	9-16
8.50	5.50	4.40	4.00	3.80	3.70	3.65
⅝	¾	⅞	1 to 1¼ inch.			
3.60	3.55	3.50	3.40	per 100 lb.		

German Coil ..... 60 &10c&10%

Halters and Ties—

Halter Chains.....60c&10@60c&10@10%
German Halter Chains, list July 24, '97 ..... 60c&10c&10@70c&10%
Cow Ties ..... 60@60c&10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring...$28.00
6½—6-2, Straight, with ring...$28.50
6½—8-2, Straight, with ring...$30.00
6½—10-2, Straight, with ring...$35.00
Add 2¢ per pair for Hooks.
Twist Traces 2¢ per pair higher than Straight Link.
Trace, Wagon and Fancy Chains.. 60@60c&10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ..... 60c&10@60c&10c&10%
Brass,..... 60c&10@60c&10c&10%
Safety Chain..... 70c&10@75c&5%
Gal. Pump Chain..... *lb* 4¼c
Covert Mfg. Co.
Breast ..... 40&2%
Halter ..... 40&2%
Heel ..... 40&2%
Rein ..... 40&2%
Stallion ..... 40&2%
Covert Sad. Works:
Breast 70%
Halter 70%
Hold Back 70%
Rein 50%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties ..... 45@50%
Eureka Coil and Halter.....45@50&5%
Niagara Coil and Halters....45@50&5%
Niagara Cow Ties.....45&5@50&10&5%
Niagara Wire Dog Chains....45@50&5%
Wire Goods Co.:
Dog Chain ..... 70&10%
Universal Dbl-Jointed Chain..... 50%

Chalk—(From Jobbers.)

Carpenters' Blue ..... *gro.* 40c
Carpenters', Red ..... *gro.* 35c
Carpenters', White ..... *gro.* 30c
See also Crayons.

Checks, Door—

Bardsley's 45%
Columbia ..... 50&10%
Eclipse ..... 60&10%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools 55%
Youths' Chests, with Tools 40%
Gentlemens' Chests, with Tools 30%
Farmers', Carpenters', etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty 50%
C. E. Jennings & Co.'s Machinists' Tool Chests ..... 33⅓&10%

Chisels—

Socket Framing and Firmer

Standard List..... 70@70c&10%
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Socket Firmer No. 10 ..... 60&10%
C. E. Jennings & Co. Socket Framing No. 15 ..... 60&10%
Swan's 70%
L. & I. J. White ..... 30@30&5%

Tanged—

Tanged Firmers..... 40c&5@40&10%
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Nos. 191, 181..... 16⅔&10%
L. & I. J. White, Tanged..... 25&5%

Cold—

Cold Chisels, good quality.lb. 13@15c
Cold Chisels, fair quality..lb. 11@12c
Cold Chisels, ordinary.....*lb. 9 @10c*

Chucks—

Beach Pat., each $8.00.. ..... 35&5%
Pratt's Positive Drive 25%
Empire 25%
Blacksmiths' 25%
Skinner Patent Chucks:
Combination Lathe Chucks 40%
Drill Chucks, Patent and Standard 30%
Drill Chucks, New Model 20%
Independent Lathe Chucks 40%
Improved Planer Chucks 25%
Universal Lathe Chucks 40%
Face Plate Jaws 40%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination 50%
Czar Drill 35%
Combination Geared Scroll 40%
Geared Scroll 40%
Independent 50%
Independent Steel 40%
Union Drill 45%
Universal 50%
Independent Iron Face Flat Jaws..40%
Independent Steel Face Plate Jaws..40%
Westcott Patent Chucks:
Lathe Chucks 50%
Little Giant Auxiliary Drill 45%
Little Giant Double Grip Drill 45%
Little Giant Drill, Improved 45%
Oneida Drill 45%
Scroll Combination Lathe 45%

Clamps—

Adjustable, Hammers' ..... 20@20&5%
Cabinet, Sargent's ..... 50&10%
Carriage Makers', P., S. & W. Co. 50%
Carriage Makers' Sargent's 60%
Besly, Parallel ..... 33⅓&10%
Linemans' Utica Drop Forge & Tool Co40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners, Drain—

Iwan's Champion, Adjustable 35%
Iwan's Champion, Stationary 40%

Sidewalk—

Star Socket, All Steel....₱ doz. $4.05 net
Star Shank, All Steel....₱ doz. $3.24 net
W. & C. Shank, All steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros. 30%
New Haven Edge Tool Co.'s 45%
Fayette R. Plumb... ... 33⅓&33⅓&10%
L. & I. J. White 30%

Clippers—

Chicago Flexible Shaft Company
'98 Chicago Horse ..... $8.75 } 15%
1902 Chicago Horse ..... $10.75 }
20th Century Horse, each, $5.00 ..... 20%
Lightning Belt ..... $15.00 }
Chicago Belt ..... $20.00 } 15%
Stewart's Patent Sheep ..... $18.50 }

Finger Nail Clippers—

Smith & Hemenway Co..... doz. net $2.00

Clips, Axle—

Eagle and Superior ¼ and 5-16 inch ..... 70c&10%
Norway, ½ and 5-16 inch..70@70c&10%

Cloth and Netting, Wire —See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression and Plain Bibbs..... 65c&10@70%
Globe, Kerosene, Racking, &c., Cocks..... 65c&5@70c&5%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—

Brass, Walter B Stevens & Son's list. 40%
Embossed, Gilt, Walter B. Stevens & Son's list ..... 30&10%
Leather, Walter B. Stevens & Son s list 40%

Combs, Curry—

Metal Stamping Co ..... 30&10%

Mane and Tail—

Covert's Saddlery Works..... 60&10%

Compasses Dividers, &c.

Ordinary Goods.....75c&5@75c&10%
Bemis & Call Hdw. & Tool Co.:
Dividers 65%
Calipers, Double 65%
Calipers, Inside or Outside..... 65%
Calipers, Wing 60%
Compasses 50%

Compressors, Corn Shock—

J. B. Hughes' ₱ doz $2.50

Conductor Pipe, Calva.—

L. C. L. to Dealers:

Territory.	*Nested.*	*Not nested.*
A. Eastern.	75c&7½%	75c&2½%
B. Eastern	.75c&10&2½%	75c&7½%
Central.....	75c&7½%	75%
Southern ..	70c&10%	70c&5%
S. Western..	70c&7½%	70c&2½%

Terms, 60 days, 2% cash, 10 days. Factory shipments generally delivered.
See also *Eave Troughs.*

Coolers, Water—

Gal. each.	3	4	6	8	
Labrador	$1.20	$1.50	$1.80	$2.10	2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	2.40	$3.00	
Gal.	2	3	4	6	8
Galv. Lined Ea.	$1.35	$2.00	$2.2	$2.90	$3.90

25%

Galv. Lined side handles

Gal.	2	3	4	6	8
Each.	$1.95	$2.15	$2.40	$3.30	$4.15...25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord—Sash—

Braided, Drab..... *lb.* 35c
Braided, White, Com..... *lb.* 23@25c
Cable Laid Italian...*lb. A, 15c; B, 16c*
Common India..... *lb.* 10@10½c
Cotton Sash Cord, Twisted....20@25c
Patent Russia..... *lb.* ..@14c
Cable Laid Russia..... *lb.* ..@15c
India Hemp, Braided..... *lb* ..@18c
India Hemp, Twisted..... *lb.* 12@13c
Patent India, Twisted..... *lb.*12@13c
Anniston Cordage Co.: Braided Cotton.
Old Glory, Nos. 7 to 12..... ₱ lb 28 ¢
Anniston, Nos. 7 to 12..... ₱ lb 24 ¢
Old Colony, Nos 7 to 12..... ₱ lb 23 ¢
Anniston Drab, Nos. 7 to 12...₱ lb 28 ¢
Pearl Braided, cotton, No. 6₱ lb., 24¢; Nos. 7 to 12 23¢.
Eddystone Braided Cotton .No. 6 ₱ lb 24¢
Harmony Cable Laid Italian, No. 7 to 10 ..... ₱ lb 23¢
Peerless:
Cable Laid Italian ..... 16¢
Cable Laid Russian ..... 14¢
Cable Laid India ..... 12¢
Braided India ..... 18¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton .....₱ lb 36½¢
Braided, Italian Hemp... ... ₱ lb 36¢
Braided, Linen ..... ₱ lb 53¢
Braided, White Cotton or Spot.₱ lb 33¢
Massachusetts, White ..... ₱ lb 28 ¢
Massachusetts, Drab..... ₱ lb 32 ¢
Phœnix, White, No's 7 to 12..... 24¢
No. 6 cords, 1¢ extra.
Silver Lake
A quality, Drab, 40¢..... 10%
A quality, White, 35¢..... 10%
B quality, Drab, 35¢..... 10%
B quality, White, 30¢..... 10%
Italian Hemp, 40¢ 10%
Linen, 57½¢..... 10%

Wire, Picture—

List Oct.,'00..... *.85c&10@85c&10c&10%*

Cradles—

Grain..... *.40c&12½%*

Crayons—

White Round Crayons, gross.5½@6c
Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.
Jumbo Crayons..... gr. $3.50 } Case lots 20%
Metal Worker's' Crayons.gr. $2.50 }
Soapstone Pencils, round, flat or square..... gr.$1.50 }
Rolling Mill Crayons.....gr. $2.50 }
Railroad Crayons (composition) gr. $2.00 }
See also *Chalk.*

Crooks, Shepherds'—

Fort Madison, Heavy ..... ₱ doz. $7.00
Fort Madison, Light..... ₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden 50%

Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ₱ doz. $3.00
Wm. Rogers & Son..... ...₱ doz. $2 50
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives.....₱ doz. $3.00
No. 77 Medium Knives.....₱ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co 40%
Red Devil 50%
Smith & Hemenway Co..... 50%
Woodward 40%

Meat and Food—

American 30%

Nos.	1	2	3	4	5
Each	$5	$7	$10	$25	$50	$60

Enterprise..... 25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

Dixon's, ₱ doz ..... 30&10@40%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal ..... 4½&10@60%
Little Giant, ₱ doz..... 33⅓@40%

Nos.	305	310	312	340	392
	$35.00	$48.00	$44.00	$75.00	$68.00

N. E Food Chopper 40%
New Triumph No. 605, ₱ doz. $24.00 .. 30&10@40%
Russwin Food No. 1, $24 00; No. 2, $27.00 ..... 45&10&10%
Sterling..... 40@40&10%
No 1 ....$2.00 each No. 2.. $2.50 each
Woodruff's, ₱ doz ..... 30&10@40%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers..... ..25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c 40%
Kraut Cutters 24 x 7, 36 x 8, 30 x 9..55%
Kraut Cutters 36 x 12, 40 x 12.....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife..... ₱ doz. $3.00
Combined Slaw Cutter and Corn Grater..... ₱ doz. $4.00
Sterling $6.00 each..... 33⅓%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters 40%
Slaw Cutters, 1 Knife, ₱ gr....$18@$20
Slaw Cutters, 2 Knife, ₱ gr....$22@$36

Tobacco—

All Iron, Cheap.....*doz. $4.25@$4.50*
Enterprise..... 25&50%
National, ₱ doz. No. 1, $21; No.2, $18..40%
Sargent's, ₱ doz., No. 2..... 60%
Sargent's No 12 and 21 ..... 60&10%

Washer—

Appleton's, ₱ doz. $16.00.....50&10&10%
Bonney's 33⅓%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger...per doz., $9.00
Iwan's Improved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers, ₱ doz $6.50
Iwan's Perfection Post Hole Digger, ₱ doz. $8.50
Iwan's Split Handle Post Hole Diggers, ₱ doz $7.50
Kohler's Universal..... ₱ doz, $15.00
Kohler's Little Giant..... ₱ doz. $12.60
Kohler's Hercules..... ₱ doz. $10.00
Kohler's Invincible..... ₱ doz. $9 60
Kohler's Rival..... ₱ doz. $8.50
Kohler's Pioneer..... ₱ doz. $7.50
Never-Break Post Hole Diggers, ₱ doz. $24.00 ..... 60%
Samson, ₱ doz. $34.00..... 25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, ¼ in..... ₱ doz, $10.50
Phillips', style 077, ¼ in. ..... ₱ doz. $8.00
Phillips', style x-y, ¼ in ... ₱ doz. $11.00
Porter's Plain, No. 6..... ₱ doz. $6 75
Porter's Ornamental, No. 70. ₱ doz. $10.50
Porter's No. 99..... $9.00
Porter's No. 44..... $10.75

Drawers, Money—

Sun Money Drawers, No. 5, ₱ doz. $9.[illegible]
No. 6, with Bell, $ 0.00; No. 6, with Gong, $10.50.
Tucker's Pat. Alarm Till No. 1, ₱ doz. $18; No. 2, $15; No. 3, $12; No. 4, $18

Drawing Knives—

See *Knives, Drawing.*

Drills and Drill Stocks—

Common Blacksmiths' Drill..each $1.50@$1.75
Breast, Milliers Falls ..... 15&10%
Breast, P., S. & W ..... 40&5%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3 ..... 16⅔&10%
Johnson's Drill Points..... 16⅔&5&10%
Milliers Falls Automatic Drills....33⅓&10%
Ratchet, Curtis & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Weston's..... 33⅓%
Ratchet, Whitney's, P. S. & W 50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00..... 33⅓%

Twist Drills—

Bit Stock..... *.5c@10c@60c&10c&10%*
Taper and Straight Shank ..... *60c&10@60c&10c&5%*

Drivers, Screw—

Screw Driver Bits..per doz. ..45@75c
Balacy's Screw Holder and Driver, ₱ doz. 9¼-inch, $6; 4-in., $7.50 6-in., $9..40%
Buck Bros' Screw Driver Bits..... 30%
Champion 50%
Edson 60%
Fay's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet..... 35%
Goodell's Auto50&10&10@50&10&10&5%
Hurwood 40%
Mayhew's Black Handle..... 50%
Mayhew's Monarch..... 40&10%
Milliers Falls, Nos. 20 and 21 ..... 25&10%
Milliers Falls, Nos. 11, 12, 41 42..... 15&10%
Never Turn 60%
New England Specialty Co..... 50%
Sargent & Co.'s:
Nos. 1 and 60..... 50&10&10%
Nos. 50 and 55..... 60&10%
Nos. 20 and 40..... 70&10%
Smith & Hemenway Co ..... 40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles 30@60&10&10%
No. 88..... 70@70&10&10%
Swan's:
Nos. 65 to 68..... 50%
No. 40 ..... 40&10%
Nos. 25, 35 and 45..... 20&10&10%

Eave Trough, Galvanized

Territory. L. C. L.
A. Eastern..... *.80c&10%*
B. Eastern..... *.80c&10c&5%*
Central..... *.80c&10%*
Southern..... *.75c&10c&5%*
S. Western..... *.75c&10c&5%*
Terms, 2% for cash. Factory shipments generally delivered.
See also *Conductor Pipe and Elbows.*

Elbows and Shoes—

Factory shipments..... 60%
Perfect Elbows (S. S. & Co.)..... ..... 30%

Emery, Turkish—

	4to5	5to150	Flour
Kegs..... *lb.*	5c	5½c	3½c
½ *Kegs* ..... *lb.*	5½c	5¾c	3¾c
Kegs..... *lb*	5c	6c	
10-lb cans.10 in case	6½c	7c	6c
10-lb. cans, less than	10.10c	10c	8c

NOTE.—*In lots* 1 to 3 *tons a discount of* 10% *is given.*

Extractors, Lemon Juice —See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's ..... 50&10%
Walling's 50%

Cord and Weight—

Ives 40%

Faucets—

Cork Lined..... *.50@50c&10%*
*Metallic Key, Leather Lind*70@70c&10%
Red Cedar..... *.50@50c&10%*
Petroleum..... *.70c&10@75%*
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key..... 40%
John Sommer's Boss Tin Key..... 50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key.... 60%
John Sommer's Diamond Lock..... 40%
John Sommer's I. X. L. Cork Lined..... 50%
John Sommer's Reliable Cork Lined 50&10%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined..... 50%
John Sommer's No Brand, Cedar..... 50%
John Sommer's Perfection Cedar..... 40%
McKenna, Brass:
Burglar Proof, N. P 35%
Improved, ¼ and ⅜ inch..... 35%
Self Measuring:
Enterprise, ₱ doz. $30.00..... 40&10%
Lane's, ₱ doz. $36.00..... 40&10%
National Measuring, ₱ doz. $36..40&10%

Felloe Plates—

See *Plates, Felloe.*

Files—Domestic—

List revised Nov. 1, 1899.
Best Brands..... *70c&5@70c&10c&5%*
Standard Brands. *75c&5@75c&10c&10%*
Second Quality.... *75c&10c&10@80c&5%*

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 30%

Fixtures, Grindstone—

Net Prices:

Inch....	15	17	19	21	24
Per doz.	$2.75	2.85	3.25	3.75	4.50

P., S. & W. Co. ..... 30&10@40%
Reading Hardware Co. 60%
Sargent's ..... 40&10&10%
Stowell's Giant Grindstone Hanger, ₱ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy ..... 50&10&10%
Stowell's Grindstone Fixtures Light... 60&10%

Fodder Squeezers—

See *Compressors.*

Forges—

Buffalo Forge Co.:
Monarch, No. 1 ..... $ 8.00
Monarch, No. 2 ..... 10.00
Monarch, No. 3 ..... 12.00
Monarch, No. 4 ..... 15.00
Monarch, No. 5 ..... 18.00
Monarch, No. 6 ..... 22.00
Monarch, No. 7 ..... 28.00
Monarch, No. 8 ..... 35.00
Monarch, No. 9 ..... 45.00
Monarch, No. 10 ..... 55.00
Monarch, No. 11 ..... 70.00
Monarch, No. 12 ..... 90.00
Monarch, No. 13 ..... 110.00
Monarch, No. 14 ..... 140.00
Monarch, No. 15 ..... 180.00
Monarch, No. 16 ..... 220.00
Monarch, No. 17 ..... 280.00
Monarch, No. 18 ..... 350.00
Monarch, No. 19 ..... 450.00
Monarch, No. 20 ..... 550.00
Monarch, No. 21 ..... 700.00
Monarch, No. 22 ..... 900.00
Monarch, No. 23 ..... 1100.00
Monarch, No. 24 ..... 1400.00
Monarch, No. 25 ..... 1800.00
Monarch, No. 26 ..... 2200.00
Monarch, No. 27 ..... 2800.00
Monarch, No. 28 ..... 3500.00
Monarch, No. 29 ..... 4500.00
Monarch, No. 30 ..... 5500.00
Monarch, No. 31 ..... 7000.00
Monarch, No. 32 ..... 9000.00
Monarch, No. 33 ..... 11000.00
Monarch, No. 34 ..... 14000.00
Monarch, No. 35 ..... 18000.00
Monarch, No. 36 ..... 22000.00
Monarch, No. 37 ..... 28000.00
Monarch, No. 38 ..... 35000.00
Monarch, No. 39 ..... 45000.00
Monarch, No. 40 ..... 55000.00
Monarch, No. 41 ..... 70000.00
Monarch, No. 42 ..... 90000.00
Monarch, No. 43 ..... 110000.00
Monarch, No. 44 ..... 140000.00
Monarch, No. 45 ..... 180000.00
Monarch, No. 46 ..... 220000.00
Monarch, No. 47 ..... 280000.00
Monarch, No. 48 ..... 350000.00
Monarch, No. 49 ..... 450000.00
Monarch, No. 50 ..... 550000.00
Monarch, No. 51 ..... 700000.00
Monarch, No. 52 ..... 900000.00
Monarch, No. 53 ..... 1100000.00
Monarch, No. 54 ..... 1400000.00
Monarch, No. 55 ..... 1800000.00
Monarch, No. 56 ..... 2200000.00
Monarch, No. 57 ..... 2800000.00
Monarch, No. 58 ..... 3500000.00
Monarch, No. 59 ..... 4500000.00
Monarch, No. 60 ..... 5500000.00
Monarch, No. 61 ..... 7000000.00
Monarch, No. 62 ..... 9000000.00
Monarch, No. 63 ..... 11000000.00
Monarch, No. 64 ..... 14000000.00
Monarch, No. 65 ..... 18000000.00
Monarch, No. 66 ..... 22000000.00
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Monarch, No. 68 ..... 35000000.00
Monarch, No. 69 ..... 45000000.00
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Monarch, No. 87 ..... 2800000000.00
Monarch, No. 88 ..... 3500000000.00
Monarch, No. 89 ..... 4500000000.00
Monarch, No. 90 ..... 5500000000.00
Monarch, No. 91 ..... 7000000000.00
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Monarch, No. 99 ..... 45000000000.00
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Monarch, No. 101 ..... 70000000000.00
Monarch, No. 102 ..... 90000000000.00
Monarch, No. 103 ..... 110000000000.00
Monarch, No. 104 ..... 140000000000.00
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Monarch, No. 129 ..... 45000000000000.00
Monarch, No. 130 ..... 55000000000000.00
Monarch, No. 131 ..... 70000000000000.00
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Monarch, No. 133 ..... 110000000000000.00
Monarch, No. 134 ..... 140000000000000.00
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Monarch, No. 165 ..... 180000000000000000.00
Monarch, No. 166 ..... 220000000000000000.00
Monarch, No. 167 ..... 280000000000000000.00
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Monarch, No. 189 ..... 45000000000000000000.00
Monarch, No. 190 ..... 55000000000000000000.00
Monarch, No. 191 ..... 70000000000000000000.00
Monarch, No. 192 ..... 90000000000000000000.00
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Monarch, No. 220 ..... 55000000000000000000000.00
Monarch, No. 221 ..... 70000000000000000000000.00
Monarch, No. 222 ..... 90000000000000000000000.00
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Monarch, No. 232 ..... 900000000000000000000000.00
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Monarch, No. 234 ..... 1400000000000000000000000.00
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Monarch, No. 243 ..... 11000000000000000000000000.00
Monarch, No. 244 ..... 14000000000000000000000000.00
Monarch, No. 245 ..... 18000000000000000000000000.00
Monarch, No. 246 ..... 22000000000000000000000000.00
Monarch, No. 247 ..... 28000000000000000000000000.00
Monarch, No. 248 ..... 35000000000000000000000000.00
Monarch, No. 249 ..... 45000000000000000000000000.00
Monarch, No. 250 ..... 55000000000000000000000000.00
Monarch, No. 251 ..... 70000000000000000000000000.00
Monarch, No. 252 ..... 90000000000000000000000000.00
Monarch, No. 253 ..... 110000000000000000000000000.00
Monarch, No. 254 ..... 140000000000000000000000000.00
Monarch, No. 255 .....

Forks—

See Discounts Aug. 1, 1899, list;
Hay, 2 tine.....50&10c&5%
Boys' & Fish, 2 tine.....50c&10c&5%
Hay & Boys', 3 tine.....60c&5%
Hay & Boys', 4 tine.....66⅔%
Champion Hay.....66⅔%
Hay & Header, long 3 tine..6%
Header, 4 tine.....65%
Barley, 4 & 5 tine, Steel.....60c&20%
Manure, 4 tine.....60c&15c&21½%
Manure, 5 and 6 tine.....66⅔%&2½%
Spading.....70c&2½%
Potato Digger, 6 tine.....60c&10%
Sugar Beet.....40c&10%
Coke & Coal.....40c&10%
Heavy Mill & Street.....65%
Iowa Dig-Em Potato.....65%
Victor, Hay.....66⅔%
Victor, Manure.....66⅔%
Victor, Header.....66⅔%
Champion, Hay.....66⅔%
Champion, Manure.....60&20%
Columbia, Hay.....66⅔&5%
Columbia, Manure.....70%
Columbia, Spading.....70&10%
Yankee Wood Barley 4 tine ₱ doz. $3.00; 6 tine, $6.00.
J. & C. Potato Digger.....60&12½%
Acme Hay.....60&10&5%
Acme Manure, 4 tine.....60&20&7½%
Victoria Header.....65&15&5%
Jackson Steel Barley.....65&15&5%
Kansas Header.....66⅔%
J. & C. Favorite Wood Barley 4 tine, ₱ doz., $5.00; 6 tine, $6.00
Steel.—See Spoons.

Fountains, Stock—

Double Dewey.....₱ doz. $13.00

Frames— Saw—

White, Straight Bar, per doz. 75@80c
Red, Straight Bar, per doz $1.00@$1.25
Red, Double Brace, per doz. $1.40@1.50

Freezers Ice Cream— Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See *Pans, Fry.*

Fuse—	*Per 1000 Feet.*	
Lamp Fuse	*$2.60*	10c&2½%
Cotton Fuse	*2.90*	
Single Taped Fuse	*3.25*	
Double Taped Fuse	*4.20*	
Triple Taped Fuse	*5.00*	

Gates, Molasses and Oil—

Hebbins' Pattern....30c&5@80c&10c&5%

Gauges—

Marking, Mortise, &c.....50c&10c&5@50c&10c&10c&5%
Chapin-Stephens Co.:
Marking, Mortise, etc.50c&10@50c&10c&10%
Scholl's Patent.....50c&10@50c&10c&10%
Door Hangers.....5.@50c&10%
Eaton's Butt Gauge.....30c&10%
Stanley R. & L. Co.'s Butt & Babbet Gauge.....20@20c&10%
Starrett, Brown & Sharpe's.....25%
Starrett, Morse's.....25%
Starrett P., S. & W. Co.....30c&10%

Gimlets— Single Cut—

Bell, Metal, Assorted, gro. $1.40@1.50
Bike, Metal, Assorted gro. $2.80@3.50
Bell, Wood Handled, Assorted. gro. $1.75@2.00
Bike, Wood Handled. Assorted gro. $4.25@4.50

Glass, American Window

See Trade Report

Glasses, Level—

Chapin-Stephens Co.....60@60&10&10%

Glue—Liquid Fish—

Bottles or Cans, with Brush....25@50%
Cans 1½ pts., pts., qts., ½ gal., gal.).....25@48%
International Glue Co. (Martin's).....40&10@50%

Grease, Axle—

Common Grade.....gro. $4.50@5.50
Canton's Everlasting....10-₱ pails, ea. 85¢
Canton's Everlasting, in bxs., ₱ doz. 1 ₱ $1.20; 2 ₱ $2.00

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Griddles, Soapstone—

Ike Mfg. Co.....33⅓@33⅓&10%

Grindstones—

Cycle Emery Grinder.....$6.50
Cycle Grindstones, each.....$2.00@3.00
Ike Mfg. Co:
Improved Family Grindstones, per inch, per doz.....$2.00 } 33⅓%
Pike Mower Knife and Tool Grinder, each.....$3.00 }
Box Ball Bearing, mounted, Angle Iron Frames.....each, $3.25

Halters and Ties—

Covert Mfg. Co.:
Web.....45&2%
Cute Rope.....40&5%
Sisal Rope.....20&5%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Cute and Manila Rope Halters.....70%
Sisal Rope Halters.....60&20%
Cute, Manila and Cotton Rope Ties..70%
Sisal Rope Ties.....60&10%

Hammers—

Handled Hammers—

Miller's Machinists'..40&10@40&10&10%
Miller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....40@40&10&10%
Tack, Straw & Wilcox.....40&10&5%
Vette & Plumb:
Plumb, A. E. Nail.33⅓&7½@33⅓&10 &7½%
Engineers' and R. R. Hand.....50&7½&5@50&10&7½&5%
Machinists' Hammers50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—

Under 3 lb.....lb 50c }
3 to 5 lb.....lb. 40c } 75c&10@80
Over 5 lb.....lb. 30c } &10%
Wilkinson's Smiths'.....9½c@10c lb.

Handles—

Agricultural Tool Handles—

Axe, Pick, &c.....47@50c&5%
Hoe, Rake, &c.....45@50c&5%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50&5%
D Handles.....40%

Cross-Cut Saw Handles—

Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—

Auger, assorted.....gro. $2.50@$2.75
Brad Awl.....gro. $1.65@$1.85
Chisel Handles:
Apple Tanged Firmer, gro. ass'd. $2.40@$2.65
Hickory Tanged Firmer, gro. ass'd. $2 15@$2.40
Apple Socket Firmer, gro. ass'd, $1.75@$1.95
Hickory Socket Firmer, gro ass'd. $1.45 @ $1.60
Hickory Socket Framing, gro. ass'd. $1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, Axe, &c.....50%
Hand Saw, Varnished, doz. .80@85c
Not Varnished.....65@75c
Plane Handles:
Jack, doz. 30c; Jack Bolted.....75c
Fore, doz. ....45c; Fore, Bolted.. 90c
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle, ₱ gro.....$0.85@$1.50

Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*	*8*
Single Doz.	*$0.90*	*1.25*	*1.60*	*1.95*	*2.50*

Barn Door, New England Pattern, Check Back, Regular:

Inch	*3*	*4*	*5*	*6*
Single Doz.	*$1.30*	*1.85*	*2.50*	*3.00*

Allith Mfg. Co.
Reliable No. 1.....per.doz. $12.00
Reliable No. 2.....per.doz. $15.00
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60%
Roller Bearing.....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.15
Parlor, Standard.....$3.35
Parlor, New Model.....$2.85
Parlor New Champion.....$2.25
Barn Door, Standard.50&10&10&5%
Hinged.....$6.40
Covered.....50&10&10%
Special.....50&10&10&5%
Lawrence Bros.:
Advance.....60%
Cleveland.....60&10%
Crown.....60%
Giant.....50&10%
New York.....60%
Peerless.....60&10%
Sterling.....60%
Swing, No. 95.....60%
Union, No. 44, $5.00: No. 45 $7.00; No. 46, $9.00.
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60%
C. S. Smith Mfg. Co.:
Lundy Parlor Door.....50&10%
Monarch Barn Door.....60&10%
Never Jump Hinge.....50&10%
Peerless.....60&10%
Perfection.....50&5%
Phœnix.....70&5%
Warner's Adjustable.....70&10%
Warehouse Anti-Friction.....60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3.....$2.25
Imp'd Wood Track No. 5.....$2.25
Imp'd Steel Track No. 7.....$2 70
Imp'd Steel Track No. 7.....$2.65
Ball Bear'g Steel Track No. 9.....$2.50
Ball Bear'g Steel Track No. 10.....$2.50
Roller Bear'g Steel Track No. 11...$2.45
Roller Bear'g Steel Track No. 12...$2.40
Ball Bear'g Steel Track No 13..$2.75
Roller Bear'g Steel Track No. 14. $2 65
Ball Bear'g Trolley Track No. 15 ..60%
Ball Brg Trolley Track No. 19...60&5%
Ball Bearing Tandem Trolley Track No. 16.....30%
Silent Adjustable Track No. 18...40%
Auto Adjustable Track No. 22..40%
Trolley R. D. No. 17.....$1.60
Trolley F. D. No. 120.....$2.70
Trolley F. D. No. 121.....$2.85
Trolley F. D. No. 151.....$3.00
Roller Bearing D. D. No. 25...70&5
Roller Bearing U. S. R. D.....70&5%
Anti Friction R. D.....60&10%
Ives' Wood Track No. 1.....$2.15
Ives' Imp'd Wood Track No. 2..$2.15
Stowell Mfg. and Foundry Co.
Acme Parlor Ball Bearing.....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas.....60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator.....40%
Express.....30%
Freight Car Door.....60%
Interstate.....60&10%
Lundy Parlor Door..50&10%
Magic.....60%
Matchless.....60&10%
Nansen.....70&5%
Par or Door.....50&10%
Railroad.....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500.....50&10%
Underwriter's Fire Door.....40%
Wild West Warehouse Door.....50%
Zenith for Wood Track.....50&10%
A. L. Swett Iron Works:
Eagle.....60&10%
Hylo.....50&10%
Perfection.....60%
Pilot.....60%
Taylor & Boggis Fty Co.'s Kidder's Roller Bearing.....50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L.T. Roller Bearing.....60&10&5%
New Era Roller Bearing.....50&10%
O. K. Roller Bearing.....60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing.....60&10%
Tandem Nos. 1 and 2.....60%
Underwriters' Roller Bearing....40%
Velvet.....50%
Wilcox Auditorium Ball Bearing.20%
Wilcox Barn Trolley No. 123.....40%
Wilcox Elv. Door, Nos 112 and 122½.50%
Wilcox Elv. Door, No. 132.....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century.....50&10&10%
Wilcox O. K. Steel Track.....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing....40%
Wilcox Wideman Narrow Gauge, Ball Bearing.....40%
For Track, see *Rail.*

Extra 5@10% often given.

Hangers, Gate—

Myers' Patent Gate Hangers, ₱ doz net 4.50

Hasps—

McKinney's Perfect Hasp, ₱ doz.....50%

Hatchets—

Best Brands.....50@50&10%
Cheaper Brands.....60@60&10%
Note.—Net prices often made.

Heaters, Carriage—

Clark, No. 3, $2.25; No. 2D, $2.75: No 3B, $3.25; No. 1, $3.50 each.....15%
Clark Coal, $0.75 ₱ doz.....10%

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1868 O P Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.85*	*1.75*	*3.50*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter, (Buffalo, &c.)

No.	*1*	*1½*	*3*
Doz. pair	*$0.75*	*.70*	*.65*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Parker.....70@75%
Reading's Gravity.....50&5%
Sargent's, Nos. 1, 3, 5, 11 & 13.....70&10@75%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.80; with screws, $1.15.
Wrightsville H'dware Co.:
O. S., Lull & Porter.....7 &5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Obtenger's Positive Locking, Nos. 1 & 3.....70&10%
Shepard's Noiseless, Nos. 60, 65, 55...70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75%
1868, Old Pat'n, Nos. 1, 3 & 5.....75%
Tip Pat'n, Nos. 1, 3& 5.....75%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75..75%
Steamboat Gravity Locking, No. 10 75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%
Whipple's Patent Automatic.....30%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with Latches	*$2.00*	*2.70*	*5.00*
Hinges only	*$1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch.....doz. ....@$2.00
Without Latch....doz. ....@$1.80
Reversible Self-Closing:
With Latch.....doz. ....@$1.75
Without Latch.....doz. ....@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

No.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Spring Hinges—

Holdback, Cast Iron gro...$9.00@9.50
Non-Holdback, Cast Iron.....gro. $8.00@8.50
J. Bardsley
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking.....15%
Bommer Bros.:
Bommer Ball Bring Floor Hinges40%
Bommer Spring Hinges.....40%
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges.....50%
Chicago (Ball Bearing) Floor Hinge.....50%
Garden City Engine House.....25%
Keene's Saloon Door.....25%
Columbian Hdw. Co.:
Acme, Wrt. Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, No. 14.....₱ gr. $9.00
Columbia, No. 18.....₱ gr. $35.00
Columbia, Adjustable, No. 7 ₱ gr., $12.00
Gem, new list.....30%
Clover Leaf.....₱ gr. $12.50
Oxford, new list.....30%
Lawson Mfg. Co.:
Matchless.....35%
Matchless Pivot.....45%
Shelby Spring Hinge Co.:
Crown Jamb Hinge.....40%
Chief Ball Bearing Floor Hinge..45%
Royal Ball Bearing Floor Hinge..45%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr. $12.50
Ideal, No. 4.....₱ gr. $9.00
New Idea No. 1.....₱ gr. $9.00
New Idea, Double Acting.....35%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1901:
Light Strap Hinges.....80c&5%
Heavy Strap Hinges 80c&20c&10%
Light T Hinges.....75c&10c&5%
Heavy T Hinges.....75c&5%
Extra Heavy T Hinges..80c&2%
Hinge Hasps.....70%
Cor. Heavy Strap....80c&20c&10%
Cor. Ex. Heavy T.....80c&20%

Extra 10c&5@10c&10&5%

Screw Hook and Strap. { 6 to 12 in.....lb. 3½c / 14 to 20 in.....lb. 3 c / 22 to 36 in.....lb. 2¾c }
Screw Hook and Eye:
¾ to 1 inch.....lb. 6 c
⅝-inch.....lb. 7 c
½-inch.....lb. 9 c

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers.....35%

Hods, Coal—

	15 inch.	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25* ₱ doz.
Jap. Open	*$2.00*	*2.25*	*2.50*	*2.75* ₱ doz.
Galv. Funnel	*$3.00*	*3.25*	*3.50*	*3.75* ₱ doz.
Jap. Funnel	*$2.50*	*2.75*	*3.00*	*3.25* ₱ doz.

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar.....each $1.45
Steel Brick.....each $1.10

Hoes— Eye—

Scovil and Oval Pattern.....60c@60c&10c&10%
Grub, list Feb. 23, 1899.....60c&10c&10@70%
D. & H. Scovil.....35%

Handled—

Aug. 1, 1899, List:
Field and Garden.....70c&10%
Smith's Patent.....50%
Meadow & Rhode Island.....75%
Black Diamond.....70c&10%
Mortar and Street.....70c&10c&10%
Planters'.....75c&12½%
Cotton.....70c&10c&10%
Cotton Chopper.....75c&12½%
Weeding Hoes.....66⅔c&15%
Steel Weeders.....66⅔c&15%
Malleable Weeders.....66⅔c&15%
Ft. Madison Cotton Hoe.....75c&7½%
Ft. Madison Crescent Cultivator Hoe per doz.....75c&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. $5.00
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.60
Ft. Madison Dixie Tobacco Hoe..75c&20%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....55%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Weeding.....₱ doz. net $4.35
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

Hoisting Apparatus—

See Machines, Hoisting.

Holders— Bit—

Angular, ₱ doz. $24.00.....45&10%

Door—

Empire.....50%
Bardsley's.....45%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&10&10%

Hooks—

Hooks, Bench, see Stops, Bench.

Cast Iron—

Bird Cage, Reading.....50&10%
Bird Cage, Sargent's List.....60%
Ceiling, Sargent's List.....50&10%
Clothes Line, Reading List.....50%
Clothes Line, Sargent's List. 50&20&10%
Coat and Hat, Sargent's List..50&5&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....50%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....50&10%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt.....80c&10%
Wire C. & H. Hooks.....70c&10@75%
Atlas, Coat and Hat:
Single Cases.....70%
10 Case Lots.....70&10%
Columbian Hdw Co. Gem.....60&10%
Parker Wire Goods Co.: King.....70&10%

Fire Goods Co:
Acme.....60&10%
Chief.....70%
Crown.....70&10%
Czar.....65%
V Brace.....70&10%
Czar Harness.....50&10%

Wrought Iron—

Box, 6 in., per doz. $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@1.25
Wrought Staples, Hooks, &c.—
See *Wrought Goods.*

Miscellaneous—

Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50

Grass.....Nos.	1	2	3	4
Best.....	$1.50	1.75	2.00	
Common.....	1.30	1.50	1.40	1.60

Potato and Manure.....60@15%
Wheelbarrow.....lb. 5¾@6c
Hooks and Eyes:
Brass.....60@10@10@70%
Malleable Iron.....70@5@70@10%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $5.25 net
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—See *Shoes, Horse.*

Hose Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 4½@ 5 c
3-ply Standard.....ft. 6½@ 7 c
4-ply Standard.....ft. 7½@ 8 c
3-ply extra.....ft. 8½@ 9 c
4-ply extra.....ft. 10 @10½c
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 6 @7 c
Fair quality.....ft. 8 @9 c

Irons—Sad—

From 4 to 10.....lb. 2¾@3 c
B. B. Sad Irons.....lb. 3¼@3½c
Chinese Laundry.....lb. 4¾@5c
Chinese Sad.....lb. 4@4¼c
Mrs. Potts', per set:

Nos.....	50	55	60	65
JapdTops	71	68	81	78
TinaTops	74	71	84	81

New England Pressing, lb..3¾@4c

Pinking—

Pinking Irons.....doz. 50@60c

Soldering—

Soldering Coppers 2½ and 3..19@20c
1¼ and 2.....21@22c

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....80&5%
Steel.....45&2½
Covert's Saddlery Works':
Daisy.....60&10%
Victor.....60&10%
Lockport.....50%
Lane's Steel.....30&10%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See *Ware, Hollow.*

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Smith & Hemenway Co.....40&10%
Wilkinson Shear & Cutlery Co,.....50%
Hay and Straw—See *Hay Knives.*

Corn—

Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....70&5@70&10%
Bradley's.....35%
C. E. Jennings & Co Nos. 45, 46..60&10%
Jennings & Griffin, Nos. 51, 52..60&10&10%
Swan's.....70&10&3½%
Watrous.....10&5&10%
L. & I. J. White.....20&5@25%

Hay and Straw—

Lightning.....₱ doz. $6.50@7.00
Iwan's Sickle Edge.....₱ doz. $10.00
Iwan's Serrated.....₱ doz. $10.00
Maine.....₱ doz. $8.50

Mincing—

Buffalo.....₱ gro. $13.00

Miscellaneous—

Farriers'.....doz. $3.00@3.25
Wostenholm's.....₱ doz. $3.00@3.25

Knobs—

Base, 2¼-inch, Birch, or Maple, Rubber tip, gro.....$1.10@1.15
Carriage, Jap, all sizes..gro. 40@45c
Door, Mineral.....doz. 65@70c
Door, Por. Jap'd.....doz. 70@75c
Door, Por. Nickel....doz. $2.05@2.15
Bardsley's Wood Door, Shutter, &c..15%
Picture, Sargent's.....60&10&10%

Lacing Leather—See *Belting Leather—*

Ladders, Step, Etc.—

Lane's Store.....25%
Myers Noiseless Store Ladders.....30%

Ladles—Melting—

L. & I. J. Mfg. Co, Low List.....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....45&10%

Lanterns—Tubular—

Regular Tubular No. 0 doz. $4.35@4.75
Lift Tubular..No. 0..doz. $4.75@5.25
Hinge Tubular..No. 0..doz. $4.75@5.25
Other Styles.....50&10@40&10&5%

Bull's Eye Police—

No. 1 2¾ inch.....$2.50@2.75
No. 2, 3 inch.....$2.75@3.00

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%
Stowe l's Badger, Cast Iron.....30%

Latches—Thumb—

Roggin's Latches, with screw, dz 35@40c

Leaders, Cattle—

Small.....doz. 55c; large, 60c
Covert Mfg. Co.....45&2%

Lifters, Transom—

R & E.....33⅓%

Lines—

Wire Clothes, Nos...	18	19	20
100 feet.....	$2.20	2.00	1.65
75 feet.....	$1.80	1.70	1.30

Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3.....40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gr.....30%
Anniston Waterproof Clothes, 50 lt., ₱ gro.: $26.00; Gilt Edge, $24.00; Air Line, $24.00; Acme, $19.00; Alabama, $17.00; Empire, $18.00; Advance, $15.00; Oriole, $22.00; Albermarle, $15.00; Eclipse, $13.50; Chicago, $12.50; Standard, $11.00; Columbia, $9.50.

Locks—Cabinet—

Cabinet Locks.....33⅓@33⅓&7½%

Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]
Reading Hardware Co.....50%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—

Stowell's.....50%

Padlocks—

Wrought Iron.....75&10&5@80&5%
R. & E. Mfg. Co. Wrt Steel and Brass.....75@75&10%

Sash, &c.—

Ives' Patent.:
Bronze and Brass.....62½%
Crescent.....50%
Iron.....62½%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Reading.....net 50%

Machines—Boring—

Com., Upright, Without Augers..$2.00
Com., Angular, Without Augers..$2.25

R. & E. Mfg. Co.:	Upright.	Without Augers. Angular.
Improved No. 3.	$4.25	No. 1 $5.00
Improved No. 4.	3.75	No. 2 3.38
Improved No. 5.	2.75	
Jennings'. No. 4,	3.15	No. 1, 3.50
Millers' Falls.		5.75
Snell's, Rice's Pat.	2.50	2.75

Corking—

Reisinger Invincible Hand Power.....₱ doz. $48.00

Fence

Williams' Fence Machines.....each, $5.50

Holsting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.20%

Ice Cutting—

Chandler's.....15&10%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1; Boss Rotary	$57.00
Boss No. 7; Dietz Rotary	80.00
Champion Rotary; Banner No. 1.	54.00
Standard Champion No. 1	48.00
Standard Perfection	36.00
Cintl Square Western	30.00
Uneeda American, Round	29.00

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners', Hickory and Applewood, doz.....50@55c

Mats—Door—

Elastic Steel (W. G. Co.).....10%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk*

Mills—Coffee, etc.—

Enterprise Mfg. Co.....25@30%
National, list Jan. 1, 1900.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10&60%
Sun, No. 108, 1 lb mill.....₱ doz $3.00
Swift, Lane Bros Co.....30%

Mowers, Lawn—

Net prices are generally quoted.
Cheap.....all sizes, $1.90@1.95
Good.....all sizes, $2.25@2.50

	10	12	14	16-inch
High Grade	4.25	4.50	4.75	5.00

Continental.....60&5%
Great American.....70%
Great American Ball Bearing, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing.....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....35½&5%
Pennsylvania Pony.....40&5%
Philadelphia:
Style M., S., C., K. T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, low list..40&5%

Nails—

Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899, 85 & 10@85 & 10 & 10%
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
A. C.	25	23	22	21	21	40&5%
Ausable.	28	26	25	24	23	50&10%
C. B. K.	25	23	22	21	21	40%
Champ'in	28	26	25	24	23	50%
Clinton.	19	17	16	15	14	30&10&5%
Maud S.	25	23	22	21	21	50%
Putnam.	23	21	20	19	18	33⅓%
New "	19	18	17	16	16	10&10%

American, Nos. 5 to 10, ₱ lb.....9@9½c
Jobbers' special brands, per lb. 8@8½c

Picture—

	1½	2	2½	3	3½ in.
Brass Head.	.45	.60	.70	.95	1.00 gro.
Por. Head.	..	1.10	1.10	1.10	.. gro.

Nippers, See *Pliers and Nippers.*

Nuts—

Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, plain.....$5.10
Hexagon, plain.....$5.60
Square, C. T. & R.....$5.30
Hexagon, C. T. & R.....$5.00
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank.....$6.00
Hexagon Blank.....$6.50
Square Tapped.....$6.00
Hexagon Tapped.....$6.50

Oakum—

Best or Government.....lb. 6¼c
Navy.....lb. 4¾c
U. S. Navy.....lb. 5¾c
Plumbers' Spun Oakum.....2¾c
In carload lots ¼c lb. off f. o. b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....60&10%
Tin or Steel.....70&10@75%
Zinc.....65&10%
Chase or Paragon:
Brass and Copper.....45&10@50%
Tin or Steel.....75@75&10%
Zinc.....65%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz. 20%
Malleable, Hammers' Old Pattern, same list.....50&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers etc.....60@60&10%

Openers—Can—

French.....doz. 35c
Iron Handle.....doz. 25@27c
Sprague, Iron Hdle., per doz. 35@40c
Sardine Scissors...doz. $1.75@$3.00
Marvel.....per doz. $1.25
National.....50%
Stowell's Sprague.....per doz. 35@45c
Tip Top.....per doz. $0.75
Triumph Shear.....₱ gro. $9.00

Egg—

Nickel Plate.....per doz., $2.00
Silver Plate.....per doz., $4.00

Packing—

Asbestos Packing, Wick and Rope, 14½@15c lb.

Rubber—

Sheet, C. I.....8@10c
Sheet, C. O. S.....9@13c
Sheet, C. B. S.....10@11c
Sheet, Pure Gum.....50@65c
Sheet, Red.....40@50c
Jenkins' Standard, ₱ lb 80c....25@25&5%

Miscellaneous—

American Packing.....7@10c lb.
Cotton Packing.....16@25c lb.
Italian Packing.....9@12½c lb.
Jute.....4@4½c lb.
Russia Packing.....8@11c lb.

Pails—Creamery

S. S. & Co., with gauges.. No 1 60&25; No. 2, $3.50 ₱ doz.

Galvanized—

Price per doz.

Quart.....	10	12	14
Water, Regular.	1.50	1.75	2.00
Water, Heavy.....	2.75	3.00	3.25
Fire, Rd. Bottom.	2.30	2.60	2.80
Well.....	2.25	2.50	2.75

Pans—Dripping—

Standard List.....60&10@60&10&5%

Fry—

Common Lipped:

No.	1	2	3	4	5
Per doz.	$0.85	1.00	1.10	1.30	1.50

Roasting and Baking—

Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10 $5.25; 20, $5.75; 30, $6.25.
Savory, ₱ doz., net, Nos. 300, $9.00; 400, $15.00.
Simplex, ₱ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	31.00	39.00	46.00

Paper—Building Paper—

Asbestos: lb.
Building Felt.....2¾c
Mill Board, sheet, 40 x 40 inches 3½c
Mill Board, roll, thicker than 1-16 inch.....3½c
Mill Board, roll, 1-16 in. thick and less.....2¾c

Per roll

Rosin Sized Sheathing: 500 sq. ft.
Light wt., 25 lbs. to roll..$0.40@0.45
Medium wt., 30 lbs. to roll..$0.45@0.50
Heavy wt., 40 lbs. to roll..$0.65@0.70
Black Water Proof Sheathing, 500 Sq ft., 1 ply, 65c; 2 ply, 85c; 3 ply, $1.10; 4 ply, $1.25.
Leatening Felt, 5, 6 and 4½ sq. ft. to lb., ton.....$41.00
Red Rope Roofing, 250 sq. feet per roll.....$1.75
NOTE.—*These goods are often sold at delivered prices.*

Tarred Paper.

1 ply (roll 500 sq. ft.), ton..$32.50@35.50
2 ply, roll 108 sq. ft.....55@60c
3 ply, roll 108 sq. ft.....78@80c
Slater's Felt (roll 500 sq. ft.).....75c
NOTE.—*Above prices often include delivery.*
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.).....$2.00

Sand and Emery—

Flint Paper and Cloth...50&10@60%
Garnet Paper and Cloth.....25%
Emery Paper and Cloth...50&10@60%

Parers—Apple—

Advance.....₱ doz. $4.
Baldwin.....₱ doz. $3.
Bonanza Improved.....each $8.
Dandy.....each $7.
Eureka Improved.....each $20.
Family Bay State.....₱ doz. $15.
Improved Bay State.....₱ doz. $36.
New Lightning.....₱ doz. $7.
Reading 72.....₱ doz. $4.
Reading 78.....₱ doz. $7.
Turn Table '98.....₱ doz. $6.
White Mountain.....₱ doz. $6.

Potato—

Saratoga.....₱ doz. $7.
White Mountain.....₱ doz. $6.

Picks and Mattocks—

List Feb. 23, 1899...60@10@60@10@10

Pinking Irons—

See *Irons, Pinking.*

Pins—Escutcheon—

Brass.....60@60@
Iron, list Nov. 11, '85.....60@60@

Pipe, Cast Iron Soil—

Standard, 2-6 in.....50@
Extra Heavy, 2-6 in.....
Fittings.....

Pipe, Merchant,

Steel or Iron, Carload Lots, f.o.b., Pittsburgh.

Merchant Pipe.	*Black.*	*Galvanized*
⅛, ¼, ⅜ inch.....	68%	58%
½-inch.....	70%	60%
¾ to 6 inch.....	75%	65%
7 to 12 inch.....	69%	59%

Pipe, Sewer—

Jobbers' Prices—
Standard Pipe and Fittings, 2 to 12 in.
New England.....
New York and New Jersey.....
Maryland, Delaware, East Penn.
West Penn and West Va.....
Virginia.....
Ohio, Michigan and Ky.....
Indiana.....
Carload lots are generally delivered

Pipe, Stove—

Edwards' Nested Stove Pipe:

	C. L.	L. C.
5 in., per 100 joints	$7.50	$8.00
6 in., per 100 joints	8.00	9.00
7 in., per 100 joints	9.00	10.00

Planes and Plane Irons—Wood Planes—

Bench, First quality....40@5@40@10
Bench, Second qual.....60@5@50@10
Molding.....33⅓@5@33⅓@10
Bailey's (Stanley R. & L. Co) 5&10@25&10&10
Chapin-Stephens Co.:
Bench, First Quality.....40@40@
Bench, Second Quality.....50@50@
Molding.....33⅓@33⅓@
Toy and German.....30@30@
Gage Self Setting
Union.....

Iron Planes—

Bailey's (Stanley R. & L. Co).....25&10@25&10&10
Chaplin's Iron Planes.....20@20@20&10&10
Miscellaneous Planes (Stanley R. & L. Co.).....20&10@20&10&10
Sargent's.....60@60@10
Union.....

Plane Irons—

Wood Bench Plane Irons.....30@5@30@
Buck Bros.
Chapin-Stephens Co.....30@30@
Stanley R. & L. Co...20&10@20&10&10
L. & I. J. White.....20&5@

Planters, Corn, Hand.

Kohler's Eclipse.....₱ doz. $3.

Plates—

Felloe.....lb. 3½@
Self-Sealing Pie Plates (S. S. & Co.), doz. $2.00

Pliers and Nippers—

Button Pliers.....75@75&10
Gas Burner, per doz., 5 in., $1.30; 6 in., $1.45@$1.50
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers.....50@50&
Bernard's:
Cutting Nippers.....
Parallel Pliers.....
Paragon Pliers.....
Lodi Pliers.....
Elm City Fence Pliers.....
Cronk & Carrier Mfg. Co.:
American Button.....75&10
Cronk's.....
Improved Button.....70&10
Grub's Pattern.....
Combination and others.....
Heller's Farriers' Nippers, Pincers, and Tools 40&10@40&10&10
P., S. & W. Tinners' Cutting Nippers.....50@50
Swedish Side, End and Diagonal Cutting Pliers.....
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....

Plumbs and Levels—

Chapin Stephens Co.:
Plumbs and Levels.....30@30&10@
Chapin's Imp. Brass Cor.....40&10@
Pocket Levels.....30@30&10@
Level Glasses.....60@60&10@
Disston's Plumbs and Levels.....
Disston's Pocket Levels.....
C. E. Jennings & Co.'s Iron.....
C. E. Jennings & Co.'s Iron, A 1.....
Stanley R. & L. Co.....10&10@10&10&10

Duplex..... 20@20&10&10%
Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $12.00; No. 4, $12.00..... 50%

Points, Glaziers'—

Bulk and 1 lb. papers.... lb. 6¼c
¼ lb. papers..... lb. 6¼c
½ lb. papers..... lb. 6¼c

Pokes, Animal—

Madison Hawkeye..... ₱ doz. $3.25
Madison Western..... ₱ doz. $4.00

Police Goods—

Manufacturers' Lists.....25@25&5%
Power's..... 25%

Polish—Metal—

Crystoline Liquid, No. 1 (¼ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72..... 40%
Crystoline Paste..... 40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Parkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ¼ pt. cans, ₱ doz..... $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans .. ₱ lb 10¢
Black Eagle, Liquid, ¼ pt. cans ₱ doz. 75¢
Black Jack Paste, 3½ lb cans. ₱ gro. $9.00
Black Kid Paste, 5 lb can..... each, $0.65
Kidd's Black Beauty, gr. $10.00..... 10%
Joseph Dixon's, ₱ gr. $5.75..... 10%
Dixon's Plumbago..... ₱ lb 8¢
Graphside..... ₱ gr. $2.50
Imp, ₱ gr. $4.50..... 10%
Japanese..... ₱ gr. $3.50
Jet Black..... ₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans..... ₱ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box..... ₱ doz. $1.00
Black Silk 5 oz. box..... ₱ doz. $0.75
Black Silk, ½ pt. liq..... ₱ doz. $1.00

Poppers, Corn—

Pat., Square..... gro. $9.00
Pat., Round..... gro. $10.00
Pat. gt. Square..... gro. 11.00
Pat., Square..... gro. 13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts, each..... $1.20

Potato Parers—

See *Parers, Potato.*

Pots— Glue—

Enameled..... 40%
Tinned..... 35%

Powder—

Canisters:
Duck, 1 lb. each..... 45c
Fine Sporting, 1 lb. each..... 75c
Rifle, ½-lb. each..... 15c
Rifle, 1-lb. each..... 25c
Dupont's Semi-Smokeless:
Keg (25 lb bulk)..... $6.50
Half Keg (12½ lb bulk)..... $3.50
Quarter Keg (6¼ lb bulk)..... $1.90
Case 24 (1 lb cans bulk)..... $8.50
Half case (1 lb cans bulk)..... $4.50
Dupont's Smokeless: Shot Gun Rifle
Keg (25 lb bulk)..... $12.00 $15.00
Half Keg (12½ lb bulk) 6.25 7.75
Quarter Keg (6¼ lb bulk) 3.25 4.00
Case 24 (1 lb cans bulk) 14.00 17.00
Half case 12 (1 lb cans bulk) 7.25 8.75
Smith Hood Smokeless Shot Gun .50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co..... 20@25%
Instbie..... 33⅓%
2 qt., $2.00; 4 qt., $4.00; 10 qt., $6.00 each.

Seal Presses—

Merrill's No. 1, per doz. $20.00..... 50%

Pruning Hooks and Shears—See *Shears.*

Pullers Nail—

Clipse..... 50%
Daily Improved Nail Puller..... 30%
Keller's Falls No. 3, per doz. $12.00..... 33⅓&10%
Larson No. 1, Cyclone Spike Puller, each $30.00..... 30%
Mclean, ₱ doz. $9.00..... 40&10%
Stanton, Case Lots:
No. 2 B (large)..... $5.50
No. 3 B (small)..... $5.00
Smith & Hemenway Co.:
Flax..... 60%
Diamond B, No. 2, case lots, ₱ doz $6.00
Diamond B, No. 3, case lots, ₱ doz $5.50
Eureka..... 50%
Nut, No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15..... 40%
Yankee..... 60⅔%

Pulleys—Single Wheel—

Inch.....	2	2½	3
Turning, doz	$0.55	.85	1.15

Key Fork, Swivel or Solid Eye..... doz., 4 in., $1.15; 5 in., $1.40

Inch.....	2	2½	2¾
Post Hole, doz	$0.70	.90	1.25

Inch.....	1¼	1½	1¾	2
Screw, doz	$0.16	.19	.23	.30

Inch.....	1½	2	2½	2½
Side, doz	$0.30	.40	.55	.65

Inch.....	1¼	1½	2	2½
Swivel, doz	$0.30	.42	.58	1.00

Bissell's:
Ceiling or End, Anti-Friction..60&10%
Curb Pump Valter, Anti-Friction...60&10%
Electric Light..... 60%
Side, Anti-Friction..... 60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ and 2 in..16@19c
Auger Mortise, no Face Plate, per doz. 1¾ and 2 in..... 16@19c
Auger Mortise, with Face Plate, per doz., 1¾ and 2 in..... 16@19c
Acme..... 1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2 in. ₱ doz 50%
Grand Rapids All Steel Noiseless....50%
Ideal..... 70&5%
Niagara..... 1¾ in., 16¢; 2 in., 19c
No. 26, Troy....1¾ in., 14½¢; 2 in., 16½¢
Star..... 1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern..... 60@6 0&10%
Pitcher Spout..... 80@80&10%
Wood..... 50@50&10%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch..	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch..	3	3¼	3½	3¾ 4
	$3.30	3.60	3.85	4.10 4.40

Plunger Cup Leathers—Per 100:

Inch	2½	3	3½	4
	$2.75	3 85	5.00	6.00

Barnes Dbl. Acting (low list).... 50&10%
Contractors' Rubber Diaphragm No. 2 R. & L. Block Co..... $16.00
Daisy Spray Pump..... ₱ doz. $7.20
Flint & Walling's Fast Mail (low list).55%
Flint & Walling's Pitcher Spout..... 80%
National Specialty Mfg. Co., Measuring $4.00..... 80%
Mechanical Sprayer..... $7.20
Myer's Pumps, low list..... 50%
Myers' Power Pumps..... 50%
Myers' Spray Pumps..... 50%

Punches—

Saddlers' or Drive, good..doz. 65@70c
Spring, single tube, good quality... $1.75@2.00
Revolving (4 tubes)...doz. $3.50@3.75
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check..... 55%
Benard Spring Belt Punches..... 33⅓%
Lodi Spring Belt Punches..... 50%
Morrill's No. 1 (A.B.C.), ₱ doz., $15.00 ..50%
No. 2, ₱ doz. $22.50..... 50%
Hercules, each $7.50..... 50%
Niagara Hollow Punches..... 40%
Niagara Solid Punches..... 55&10%
Paragon Spring Belt Punches..... 50%
Steel Screw, B & K. Mfg. Co..... 40%
Tinners' Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44..... 60%

Rail— Barn Door, &c.—

Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:

	½	⅝	¾	⅞ in.
	$1.70	$2.10	$3 00	100 feet.

Angular for Sq. Groove Wheels:

	Small.	Med.	Large.	
	$1.50	1 90	2.50	100 feet.

Sliding Door, Iron Painted..2 @2¾c
Sliding Door, Wrought Brass, 1¼ in..... lb.30c..30%
Allith Mfg. Co., No. 1, Reliable Hanger Track, ₱ foot..... 8¢
Allith Mfg. Co., No. 2, Reliable Hanger Track, ₱ foot..... 10¢
Cronk's Double Braced Steel Rail, ₱ foot..... 3½¢
Cronk's O. N. T. Rail..... 3½¢
Lane's Hinged Track, ₱ 100 ft., 1 in., $3.70; 1¼ in., $4.40
Lanes' O. N. T., ₱ 100 ft., 1 inch, $3.00; 1¼ inch, $3.70; 1¼ inch, $4.00.
Lanes' Standard, 1¼ in., ₱ 100 ft 4.0
Lawrence Bros., ₱ ft. 11¢ 60%
Lawrence Bros. New York..... 3½¢
McKinney's Hinged Hanger Rail ₱ foot, 11¢..... 50%
McKinney's None Better..... ₱ ft. 3½¢
McKinney's Standard..... ₱ ft. 4 ¢
Myers' Stayon Track..... 50&10%
Smith's Wrought Bracket, Plain..... 3½¢
Smith's Special..... 4½¢
Smith's Never Jump, per ft. 11¢..... 50%
Smith's Plain Steel..... 30%
Smith's Milled Steel..... 4½¢
Stowell's Cast Rail..... ₱ ft. 1½¢
Stowell's Steel Rail, Plain..... 2½
Stowell's Wrought Bracket, 1 3-16 in..... ₱ ft. 3¢
Stowell's Wrought Bracket, 1½x5-16..... ₱ ft. 7¢
Swett's Hylo, per ft. 11¢..... 50&10%
Swett's P. L. B. Steel Rail, ₱ 100 ft. $3.00

Rakes—

Net Prices, Malleable Rakes:

	10	12	14	16-tooth
Shank.....	$1.50	1.60	1.75	1.85
Socket.....	$1.65	1.80	1.95	2.10

Steel, Garden and Gravel, Aug. 1, '99 List 70%
Weldless Steel ..... 75&5%
Malleable Iron, Garden..... 70&10%
Lawn Rakes, Metal Head, per doz.,
20 teeth..... $3.25@3.50
24 teeth..... $3.50@3.75
Fort Madison Red Head Lawn..... $3 25
Fort Madison Blue Head Lawn..... $3.00
Jackson Lawn, 29 and 30 teeth, ₱ doz., net, $4.25
Kohler's:
Lawn Queen, 20-tooth, ₱ doz..... $3.45
Lawn Queen, 24-tooth, ₱ doz $3.60
Paragon, 20 tooth, ₱ doz $2.75
Paragon, 24-tooth, ₱ doz..... $3.00
Steel Garden, 14-tooth, ₱ doz. $2.88
Malleable Garden, 14-tooth, ₱ doz. ..$2.00

Rasps, Horse—

Disston's..... 75%
Heller Bros..... 70&5@70&10@5%
McCaffrey's American Standard..... 60&10&5%
New Nicholson..... 70&10@75%
See also *Files.*

Razors—

Borasic..... 60 & 10%
Fox Razors, No. 42.. ₱ doz. $20.00 } dis.
Fox Razors, No. 44.. ₱ doz. $20.00 } 25%
Fox Razors, No. 82, Platina, ₱ doz. $25.00
Red Devil..... 60%
Silberstein:
Carbo Magnetic..... $18.00
Griffon, No. 05..... $15.00
Griffon, No. 00..... $12.00
All other Razors..... 40%

Safety Razors—

Safety Razors..... 40%
New Gem, in Tin Boxes..... ₱ doz. $12.00
New Gem, Extra Blades..... ₱ doz. $8.35
Gem Outfits (Razor, Strop, etc.) ₱ doz. $15.60
Complete Razor, extra Blade in Leather Case..... ₱ doz. $27.00
Silberseein..... 40%

Reels— Fishing—

Bishop's Independent Fish Reel Spooler, ₱ doz..... $30.00
Hendryx:
M 6, Q 6, A 6, B 6, M 9½, M 13, Q 16, A 16, B 16, 4008, Rubber Populo, Nickeled Populo..... 20%
Aluminum, German Silver, Bronze..25%
1240 N, 124 N..... 20%
3004 N, 06 N, 6 RM, G 0..... 25%
4 N, 6 PN, 24 N, 26 PN..... 20%
2004 P..... 33⅓%
2004 PN..... 33⅓%
0924 N..... 33⅓%
02084 N..... 33⅓%
002904 PN..... 33⅓%
802 N..... 33⅓%
986 PN, 2904 N, 974 PN..... 25%
5009 PN, 5009 N..... 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR..... 2[illegible]
304 P, 304 PN, 00304 P, 00304 PN..33⅓%

Registers—*List July* 1, 1903.

Black Jap..... } 70¢10@5
White Jap..... } &10%
Bronzed..... }
Nickel Plated..... }
Electro Plated..... }

Registers, Cash—

Sun, No. 10, Metal Cabinet..... $30.00
Sun, No. 10, Wood Cabinet..... $25.00

Revolvers—

Single Action..... 85@90c
Double Act'n, except 44 cal..... $1.90
Double Action, 44 caliber..... $2.05
Automatic $3.60
Hammerless..... $4.10
Note.—Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in., per doz..... $2.25@$2.50
17 in., per doz..... $2.50@$2.75
18 in., per doz..... $2.75@$3 00

Rings and Ringers—

Bull Rings—

	2	2½	3 Inch
Steel.....	$0 70	0.75	0.80 doz.
Copper.....	1.00	1.15	1.40 doz.

Hog Rings and Ringers—

Hill's Rings....gro. boxes, $4.25@4.50
Hill's Ringers, Gray Iron, doz. 50@55c
Hill's Ringers, Mal. Iron, doz. 70@75c
Flair's Rings.....per gro. $5.00@5.25
Blair's Ringers...per doz. $0.60@ .65
Brown's Rings....per gro. $5.25@5.50
Brown's Ringers..per doz. $0.55@ .70

Rivets and Burrs—

Copper..... 60@60&5%
Iron or Steel:
Tinners' ..... 75&10@75&10&5%
Miscellaneous ..... 70&10@75%

Rollers—

Acme, Stowell's Anti-Friction..... 50%
Barn Door, Sargent's list..... 60%
Cronk's Stay..... 66⅔%
Cronk's Brinkerhoff..... 66⅔%
Lane's Stay ..... 33⅓&5%
Stowell's Barn Door Stay.....₱ doz. $1.00

Rope—

Manila, 7-16 in. diam. and larger, tarred or untarred..... lb. .. @11½c
Manila, Hay, Hide and Bale Ropes, Medium and Coarse..... lb. .. @11½c
Sisal, 7-16 in. diam. and larger:
Mixed ..... lb. .. @ 8 c
Pure..... lb. .. @ 9¼c
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed ..... lb. .. @ 8 c
Pure..... lb. .. @ 9¼c
Sisal, Tarred, Medium Lath Yarn:
Mixed..... lb. .. @ 7½c
Pure..... lb. .. @ 8¼c
Cotton Rope: —Lb.—
Best..... ¼-in. and larger.. 18@45c
Medium..¼-in. and larger.. 16@18c
Com ....¼-in. and larger..12@13c
Jute Rope:
Thread No. 1, ¼-in. and up, lb. 6 c
Thread No. 2, ¼-in. and up, lb. 5½c
Old Colony Manila Transmission Rope, ₱ lb 17½¢

Wire Rope—

Galvanized..... 40&5%
Plain ..... 45&5%

Ropes, Hammocks—

Covert Mfg. Co.:
Jute..... 40&5%
Sisal..... 30%
Covert Saddlery Works..... 60&5%

Rules—

Boxwood..... 60&10@60&10&5%
Ivory..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood..... 60@60&10%
Ivory..... 35@35&10&10%
Miscellaneous..... 50@50&10&10%
Combination..... 55@55&10%
Stationers'..... 10@10&10%
Lufkin's Steel..... 50&10%
Lufkin's Lumber..... 60&10%
Stanley R. & L. Co.:
Boxwood..... 60@60&10%
Ivory..... 35@35&10&10%
Upson Nut Co.:
Boxwood..... 60@60&10%
Ivory..... 35&10@35&10&10%

Sash Locks—See *Locks, Sash*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saw Frames—See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins:
Circular..... 50%
Band..... 50&10@60%
Cross Cuts..... 35&5%
Mulay, Mill and Drag..... 50%
One-Man Saw..... 40%
Wood Saws..... 40%
Hand, Compass, &c..... 40%
Chapin-Stephens Co.:
Turning Saws and Frames... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws..... 30&10&5%
Disston's:
Circular, Solid and Inserted Tooth..50%
Band, 3 to 14 in wide..... 60%
Band, ¼ to 2¾..... 70%
Crosscuts..... 45%
Narrow Crosscuts..... 50%
Mulay, Mill and Drag..... 50%
Framed Woodsaws..... 35%
Woodsaw Blades..... 35%
Woodsaw Rods..... 25%
Hand Saws, Nos. 12, 99, 9, 10, d100, D8, 120, 79, 77, 8..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination..... 30%
Compass, Keyhole, &c..... 25%
Butcher Saws and Blades..... 35%
C. E. Jennings & Co.'s.:
Back Saws..... 25&10%
Butcher Saws..... 30&10%
Compass and Key Hole Saws.35&5&10%
Framed Wood Saws..... 30&10%
Hand Saws..... 20&2½&10%
Wood Saw Blades..... 30&10%
Millers Falls:
Butcher Saws..... 15&10%
Star Saw Blades..... 15&10%
Peace & Richardson's Hand Saws..... 30%
Simonds':
Circular Saws..... 50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts..... 40&10%
Gang Mill, Mulay and Drag Saws..50%
Hand Saws..... 50%
Back Saws..... 25@25&7½%
Butcher Saws..... 35@35&7½%
Hand Saws..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Keyhole, &c ..... 25@25&7½%
Wood Saws ..... 35@35&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws..... 50%

Hack Saws—

Atkins' Hack Saw Blades A A A ... 25%
Disston:
Concave Blades..... 25%
Keystone..... 40%
Hack Saw Frames..... 30%
Fitchburg File Works, The Best..... 25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 178, 180.... 35&5&10%
Hack Saws, Nos. 178, 180, complete. 35&5&10%
Goodell's Hack Saw Blades..... 40%
Griffin's Hack Saw Frames .. 35&5&10%
Griffin's Hack Saw Blades..... 35&5&10%
Star Hack Saws and Blades..... 15&10%
Sterling Hack Saw Blades..... 25%
Sterling Hack Saw Frames.... 30& 0&5%

Scroll—

Barnes' No. 7, $15..... 25%
Barnes' Scroll Saw Blades..... 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 20%
Lester, complete, $10.00..... 15&10%
Rogers, complete, $4.00..... 15&10%

Scalers, Fish—

Bishop's Lightning..... ₱ doz. $3 00
Covert's Saddlery Works ..... 60&10%

Scales—

Family, Turnbull's..... 50@50&10%
Counter:
Hatch, Platform, ½ oz to 4 lbs. doz. $5.50
Two Platforms, ½ oz to 8 lbs. doz. $16
Union Platform, Plain..$1.70@1.90
Union Platform, Striped $1.85@2.15
Chatillon's:
Eureka..... 25%
Favorite..... 40%
Grocers' Trip Scales..... 50%
Chicago Scale Co.:
The "Little Detective," 25 lbs..... 50%
Union or Family No. 2..... 60%
Portable Platform (reduced list)..... 50%
Wagon or Stock (reduced list)... 25@35%
Pelouze Scales—Household, Counter, Candy, Ice, Postal, Computing..... 50%
"The Standard" Portables..... 50%
"The Standard" ft. R. and Wagon..... 50%

Scrapers—

Box, 1 Handle..... doz. $3.00@2.85
Box, 2 Handle..... doz. $2.60@2.85
Ship Light, $2.00; Heavy, $2.50
Adjustable Box Scraper (S. R. & L. Co.) $6.00..... 30@30&10%
Chapin-Stephens Co., Box..... 50@50&10%

Screens, Window, and Frames—

Flyer Pattern Screens...60&5@60&5&2½%
Maine Screen Frames..... 40&10&5%
Perfection Screens..... 60@5@60&5&2½%
Phillips' Screen Frames. 60&5@60&5&2½%
Porter's:
Fairview Screens ..... 60&5@60&5&2½%
Hummer Screens..... 60&5@60&5&2½%
Klondike Screens..... 6 &5@60&5&2½%
See also *Doors.*

Screws—Bench and Hand—

Bench, Iron..doz. 1 in.. $2.50@2.75 :
1¼, $3.00@3.25: 1¼, $3.50@3.75
Bench, Wood, Beech....doz. 30@30&5
Hand, Wood.....30@30&5%
R. Bliss Mfg. Co, Hand.....30%
Chapin-Stephens Co., Hand.....30@30&10%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, 99.....80&5@80&10%
Coach and Lag, Gimlet Point, list Oct. 1, '99.....80@80&5%
Hand Rail, list Jan. 1, '81.60&10@...%

Jack Screws—

Standard List.....75&10@80&5%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50@50&5%
Sargent.....70%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50@50&10%
Flat or Round Head, Brass50@50&10%

Set and Cap—

Set (Iron or Steel).....70&10&5%
Sq. Hd. Cap.....65&10&5%
Hex. Hd. Cap.....65&10&5%
Rd. or Fillister Hd. Cap.....60%

Wood—

List July 23, 1903.
Manufacturers' printed discounts :
Flat Head, iron.....87½&10@...%
Round Head, Iron.....85&10@....%
Flat Head, Brass .....85&10@....%
Round Head, Brass .....80&10@....%
Flat Head, Bronze....77½&10@...%
Round Head, Bronze.....75&10@...%
Drive Screws.....87½&10%

Scroll Saws—See *Saws, Scroll.*

Scythes— *Per doz*

Clipper Pattern, Grass...$4.25@$5.00
Full Polished Clipper.....$4.75@$5.50
Grain.....$7.00@$7.50
Clipper, Grain.....$7.75@$8.25
Weed and Bush.....$4.50@$5.00

Seeders— Raisin—

Enterprise.....25@30%

Sets— Awl and Tool—

Brad Awl and Tool Sets :
Wood Hdle., 10 Awls doz. $2.00@2.25
Wood Hdle., 14 Awls, 6 Tools ... doz. $2.50@3.00
Aiken's Sets, Awl and Tools :
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool H'dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders.....30&10%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior :
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30@30&10&10%

Garden Tool Sets—

Ft. Madison, Taree Pieces, Hoe, Rake and Shovel.....₱ doz. sets.....$9.00

Nail—

Square.....per gro. $2.25@2.50
Round, Blk. and Pol., assorted..... gro. $1.80@2.00
Octagon.....gro. $4.50@5.75
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Mayhew's.....per gro. $9.00
Snell's Corrugated, Cup Pt. per gro. $7.50
Snell's Knurled, Cup Pt.....per gro $7.50

Rivet—

Regular list.....70&10@75%

Saw—

Aiken's:
Genuine.....50&10%
Imitation.....50&10%
Atkin's:
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....20%
Spring Hammer.....40%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.63.....50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 98, $15.98.....50%
No. 1 Old Style, $10.00.....50%
Special, $16.25.....50%
Giant Royal, Cross Cut .....₱ doz. $8.50
Royal, Hand.....₱ doz. $5.0
Taintor Positive. .....₱ doz $6 75

Shaving—

Fox Shaving Sets, No. 30, per doz, $24.00net

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....65%

Shaves Spoke—

Iron.....doz. $1.00@1.15
Wood.....doz. $1.75@2.00
Bailey's (Stanley R. & L. Co).....
.....20@30&10&10%
Chapin-Stephens Co .....40@30&10&10%
Goodell's, ₱ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—

Cast Iron...	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality, Jap.....70@70&10%
" Nickel.....60@60&10%
Fair qual. Jap.....80@80&5%
" Nickel.....75@75&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailors' Shears.....10%
Wilkinson's Hedge .....1900 list 45%
Wilkinson Branch, Lawn and Border 40%
Wilkinson's Sheep .....1900 list. 50%

Tinners' Snips—

Steel Blades .....20&5@20&10
Steel Laid Blades .....40&10@50%
Forged Handles, Steel Blades, Berlin.. 40@40&10%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s, 6¼ to 10 inch .....40&7½&10%
Niagara Snips 40%
P., S & W. Co. 20%
Triumph Pipe Shear.....₱ doz. 9.00

Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓%
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00 .....25%
Disston's Pruning Hook, ₱ doz. $12.00 .....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades....40@40&5%
Orange Shears.....50&10@50&20%
Grape .....40&10@50%
Tree Pruners 75%
P., S. & W. Co.....33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction 50%
Patent Roller Hatfield's, Sargent's list, 70&10%
Reading.....50%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....80%

Sliding Shutter—

Reading list.....50%
R. & E. list.....33⅓%
Sargent's list.....50&10%

Shells—Shells, Empty—

Brass Shells, Empty :
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge.. 65&5%
Paper Shells, Empty :
Acme, Ideal, Leader, New Rapid, Magic 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 15 and 20 gauge.....20%
Climax, Union, League, New Rival 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓&5%
Robin Hood, Low Brass.....20&10%
Robin Hood, High Brass.....30&10%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass.....50%
Comets, High Brass.....50&10&5%

Shoes Horse, Mule, &c.—

F. o. b., Pittsburg:
Iron.....per keg $3.85
Steel.....per keg 3.60
Burden's, all sizes, ₱ keg..... $3.90

Shot—

Drop, up to B, 25-lb. bag.....$1.60
Drop, B and larger, per 25-lb. bag $1.85
Buck, 25-lb. bag.....$1.85
Chilled, 25-lb. bag.....$1.85

Shovels and Spades—

Association List, Nov. 15, 1902....40%

Sieves and Sifters—

Hunter's Imitation, gro. $10.50@11.00

Buffalo Metallic Blued S. S.		Co. ₱ gr.:
14&16	16&18	18&20
$13.20	$13.50	$14.40

National Mfg. Co.:
Victor.....per gro. $12.00
Surprise.....per gro. $11.00
No Name.....per gro. $11 00
Shaker (Barler's Pat.) Flour Sifters. ₱ doz., $3.00.....40%

Sieves, Tin Rim—

Per dozen.

Mesh	*14*	*16*	*18*	*20*
Black, full size...	*$1.20*	*1.25*	*1.30*	*1.35*
Plated, full size .	*$1.30*	*1.35*	*1.40*	*1.45*
Black, scant....	*$6.95*	*1.00*	*1.05*	

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested, doz.....$0.90@0.95
Mesh 20, Nested, doz..... 1.00@1.05
Mesh 24, Nested, doz..... 1.30@1.40

Sinks—

Cast Iron—

Standard list.....60@60&10%
NOTE.—*There is not entire uniformity lists used by jobbers.*

Skeins, Wagon—

Cast Iron.....75@75&10%
Steel.....40@40&10%

Slates, School—

Factory Shipments.
"D" Slates.....40&10%
Noiseless Slates.....60&5 tens

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling No, 10, $2.00.....33⅓

Snaps, Harness—

German.....40@40&10%
Covert Mfg. Co.:
Derby.....30&5&2%
High Grade.....45%
Jockey.....30&10%
Trojan.....45%
Yankee.....30&5&2%
Yankee, Roller.....30&5&2%
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
Oneida Community Solid Swivel.....60%
Sargent's Patent Guarded .....60&10%

Snaths—

Scythe.....45%

Snips, Tinners'—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality..... 50&10@60&5%
Cheap.....60@60&10%
International Silver Co.
1847 Rogers Bros. and Rogers & Hamilton.....40&10%
Rogers & Bro., William Rogers Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 77 Silver Plated Ware.....60&10%

Miscellaneous—

German Silver..... 60@60&5%
Castaraugus Cutlery Co.:
Yukon Silver.....50%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list 10 &10%

Tinned Iron—

Teas.....per gro. 45@50c
Tables..... per gro. 90c@$1.00

Springs—Door—

Chicago (Coil)..... .....40&10%
Gem (Coil).....20%
Reliance (Coil)..... .....40&10%
Star (Coil).....30%
Torrey's Rod, 39 in.....₱ doz. $1.10
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.

1¼ in. and Wider :
Black or ¼ Bright, lb.....4¾@5 c
Bright, lb.....5¼@5½c
Painted Seat Springs :
1½ x 22 x 26, per pr.....50@55c
1¼ x 2 x 28 per pr..... 60@65c
1¼ x 3 x 28 and narrower, per pr. 80@85c

Sprinklers, Lawn—

Enterprise.....25@20%
Philadelphia, No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

Squares—

Nickel plated.... } List Jan. 5, 1900.
Steel and Iron... } 70&10@70&10&10%
Rosewood Hdl Try Square and T-Bevels .....60&10@70%
Iron Hdl. Try Squares and T-Bevels. 50&10@50&10&10%
Disston's Try Sq. and T-Bevels.....70%
Winterbottom's Try and Miter..... 40&10@40&10&10%

Squeezers—Lemon—

Wood, Common, gro., No. 0, $5.25 @$5.50 : No. 1, $6.25@$6.50.
Wood, Porcelain Lined.
Cheap .....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined.....doz. $1.75

Staples—

Barbed Blind. .....lb. 6@6½c
Electricians', Association list..... 80&10&10&10%
Fence Staples, Plain $2.25; Galvanized.....$2.55
Poultry Netting, Staples....per lb. 3¼@3½c
Grand Crossing Tack Co.'s list....80&10%

Steels, Butchers'—

Dick's.....30%
Foster Bros'.....30%
C. & A. Hoffmann's.....40%

Steelyards..... .....30@30&10%

Stocks and Dies—

Blacksmiths'.....40&10@50%
Curtis Reversible Ratchet Die Stock.25%
Derby Screw Plates.....25%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $8.00 per gro., 12 inch, $10.80
Norton Emery Scythe Stones:
Less than gross lots.....₱ gro. $9.00
One gross or more.....₱ gro. $7.20
Lots of 10 gross or more....₱ gro $6.00
Pike Mfg. Co. 1901 list:
Black Diamond S. S....₱ gro. $12.00
Lamoille S. S. .....₱ gro. $11.00
White Mountain S. S....₱ gro. $9.00
Green Mountain S. S....₱ gro $6.00
Extra Indian Pond S. S. ₱ gro $7.50
No. 1 Indian Pond S. S..₱ gro. $7.00
No. 2 Indian Pond S. S..₱ gro. $4.50
Leader Red End S. S....₱ gro $4.50
Balance of 1901 list 33⅓% } 40%

Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit.....50%
Gem Corundum Axe, Single or Double Grit.....35%
Gem Corundum Slips.....35%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list: ₱ lb
Arkansas Stone, No. 1, 3 to 5 in. $2.80
Arkansas Stone, No. 1, 5 to 8 in. $3.50
Arkansas Slips No. 1.....$4.00
Lily White Washita 4 to 8 in.....60¢
Rosy Red Washita, 4 to 8 in .... 60¢
Washita Stone, Extra, 4 to 8 in..50¢
Washita Stone, No. 1, 4 to 8 in..40¢
Washita Stone, No. 2, 4 to 8 in..30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
India Oil Stones (entire list) .....33⅓% } 33⅓%
Hindostan No. 1, Regular.....₱ lb 8
Hindostan No. 1 Small.....₱ lb 10
Axe Stones (all kinds) .....
Turkey Oil Stones, ex. 5 to 8 in. ₱ lb
Queer Creek Stones, 4 to 8 in.....30
Queer Creek Slips.....30
Sand Stone.....5
Belgian, German and Swaty Razor Hones.....
Natural Grit Carving Knife Hones, ₱ doz.....$3.00
Quick Edge Pocket Knife Hones, ₱ doz.....$3.00
Mounted Kitchen Sand Stone, ₱ doz.....$1.50

Stoners— Cherry—

Enterprise.....25%

Stops, Bench—

Millers Falls.....15%
Morrill's...₱ doz., No. 1, $10.00.....
Morrill's, No. 2, $12.50.....
Whipple's Combination.....₱ doz.

Door—

Chapin-Stephens Co.....60&10%

Plane—

Chapin-Stephens Co.....

Straps— Box—

Cary's Universal, case lots....20&10%

Hame—

Covert's Saddlery Works.....

Stretchers, Carpet—

Cast Iron, Steel Points....doz. 55c
Socket.....doz.
Excelsior Stretcher and Tack Hammer Combined, per doz. $6.....

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&
National Specialty Mfg. Co., list Jan 1, 1900.....30

Sweepers, Carpet—

National Sweeper Co.: Per
Loyal, Roller Bearing, Fancy Veneers.....
Marion, Roller Bearing, regular finishes, full Nickel.....
Marion Queen, Roller Bearing, full Nickel.....
Monarch, Roller Bearing, Nickel.....
Monarch, Roller Bearing, Jap'ned.....
Transparent, Roller Bearing, Plate Glass Top, Nickel.....
Monarch Extra, Roller Bearing (17-inch case), Nickel.....
Monarch Extra, Roller Bearing (17-inch case), Japanned.....
National Queen, Fancy Veneers.....
Perpetual, Regular Bearings, Nickel.....
Perpetual, Regular Bearings, Jap'd.....
NOTE.—*Discount of 50c per doz. three-dozen lots. Discount of $1 dozen on five-dozen lots.*

Tacks, Brads, &c.—

List Jan. 15, '99.
Carpet Tacks, American .....90&25&5%
American Cut Tacks.90&20&5%
Swedes Iron Tacks ...90&30&5%
Swedes Upholsterers' Tacks..... 90&45&10&5%
Gimp Tacks.....90&45&5%
Lace Tacks.....90&40&5%
Trimmers' Tacks..90&30&10&5%
Looking Glass Tacks....70&10%
Bill Posters' and Railroad Tack.. 90&45&5%
Hungarian Nails ....80&20&5%
Common and Patent Brads....80
Trunk and Clout Nails..80&5%
NOTE.—*The above prices are Straight Weights.* An extra 5% is Star Weights ** and an extra 10% Standard Weights.****

Miscellaneous—

Double Pointed Tacks...90 and
Steel Wire Brads, R. & E. Mfg. Co's 50&10

See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.....30-gal
Emerald, S. S. & Co.....60-gal.
Queen City S. S. & Co., 30-gal.....
Queen City S. S. & Co., 60-gal.....

Tapes, Measuring—

American Asses' Skin.....40&10%
Patent Leather.....25&2
Steel.....50&10
Chesterman's.....25&2
Eddy Asses' Skin.....40&10
Eddy Patent Leather.....25&2
Eddy Steel.....40&1
Keuffel & Esser Co., Steel and Metal Lower list, 1899.....
Lufkin's Steel.....33⅓
Lufkin's Metallic.....30&3

Teeth, Harrow—

Steel Harrow Teeth, plain or hea ⅝-inch and larger, per 100 lbs.

Thermometers—

Tin Case.....80&10@80&10

Ties, Bale—Steel Wire.

Single Loop.....
Monitor, Cross Head, Etc.....

Brick Ties—

Niagara Brick Ties.....

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Placed, very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tools—
L. & I. J. White ..... 20@20&5%

Coopers'—
Hay—
Myers' Hay Tools 50%
Stowell's Hay Carriers 50%
Stowell's Hay Forks 50%
Stowell's Fork Pulleys 50%

Saw—
Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—
L. & I. J. White 25%

Transom Lifters—
See *Lifters, Transom.*

Traps— Fly—
Balloon, Globe or Acme ..... doz. $1.15@1.25; gro. $11.50@12.00
Harper, Champion or Paragon ..... doz. $1.25@1.40; gro. $13.00@13.50

Game—
Oneida Pattern ..... 75&10@75&10&5%
Newnouse ..... 45@45&5%
Hawley & Norton ..... 65@65&5%
Victor (Oneida Pattern) ..... 75@75&5%
O.C. Jump (Blake Pattern) 60&5@60&10%

Mouse and Rat—
Mouse, Wood, Choker, doz. holes ..... 8½@9c
Mouse, Round or Square Wire ..... doz. 85@90c
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½; ₱ doz. $12.00
No. 3, Rat, ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₱ doz. $3.50; case of 7 $2.75 doz.
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25

Schuyler's Rat Killer, No. 1, ₱ gr. $30.00
No. 2, ₱ gr. $30.00; Mouse, No. 3, $18.00 ..... 50%

J. M Mast Mfg. Co.:	Per gro. Mouse.	Rat.
Blizzard	No. 12, $3.00	No. 1, $9 50
Old Nick	No. 30, 2.22	No. 2, 8.40
Joker	No. 5, 2.10	No. 3, 8.40

Imp'd Snap Shot, Mouse, per gro., 2 hole, $2 40.
Imp'd Snap Shot, Mouse, per gro., 4 hole, $4.20.

Trimmers Spoke—
Bonney's Nos. 1 and 2 ..... 33⅓%
Wood's F 1 ..... 50%

Trowels—
Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, 3 in.... ₱ gro. $5.00
Kohler's Steel Garden Trowels, 6 in.... ₱ gro. $6.00
Never-Break Steel Garden Trowels..... gro. $6.00
Rose Brick and Plastering ..... 25&5%
Woodrough & McParlin, Plastering .. 25%

Trucks, Warehouse, &c.—
B. & I., Block Co.:
New York Pattern ..... 50&10%
Western Pattern ..... 60&10%
Handy Trucks ..... per doz. $16.00
Grocery ..... per doz. $15.00
Daisy Stove Trucks, Improved pattern ₱ doz. $18.50
Model Stove Trucks ..... ₱ doz. $18.50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	*$5.00*	*5.50*	*6.25*
Galvanized Wash Tubs (S. S. & Co.):			
No.	1	2	3 10 20 30
Per doz., net	5.70	6.50	7.20 6.30 7 20 8.10

Twine—Miscellaneous—

Flax Twine—	BC	B.
No. 9, ¼ and ½-lb. Balls	*.22c*	*@.24c*
No. 12, ¼ and ½ lb. balls	*.18c*	*@.20c*
No. 18, ¼ and ½-lb. Balls	*.16c*	*@.18c*
No. 24, ¼ and ½-lb. Balls	*.16c*	*@.18c*
No. 36, ¼ and ½-lb. Balls	*.15c*	*@.17c*
Chalk Line, Cotton, ½-lb Balls		*.30c*
Cotton Mops, 6, 9, 12 and 15 lb. to doz		*.10@.12c*
Cotton Wrapping 5 Balls to lb ... according to quality		*.16c@.25c*
American 3-Ply Hemp, ¼ and ½-lb. Balls		*.13@.14c*
American 3 Ply Hemp, 1-lb. Balls		*.13@.14c*
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)		*.9c*
India 3-Ply Hemp, 1-lb. Balls		*.9c*
India 3-Ply Hemp, 1¼-lb. Balls		*.8c*
2, 3, 4 and 5-Ply Jute, ½-lb. Balls		*.9@.10c*
Mason Line, Linen, ½-lb. Balls		*.46c*
No. 36½ Mattress, ¼ and ½-lb Balls		*.37c*
Wool, 3 to 6 ply		*.5¾@6c*

Vises—
Solid Box ..... 50c&10@60%

Parallel—
Athol Machine Co:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Bonney's 33⅓%
Columbian Hdw. Co 40%
Emmert Universal:
Pattern Makers' No. 1 ..... $15.00
Pattern Makers' No. 2 ..... $12.50
Machinist and Tool Makers' No. 4 $12.50
Fisher & Norris Double Screw .... 15&10%
Hollands':
Machinists' ..... 40@40&5%
Keystone ..... 65&5@70%
Lewis Tool Co ..... 20@30%
Merrill's 20%
Miller's Falls ..... 60&10%
Parker's:
Victor ..... 20@25%
Regulars ..... 20@25%
Vulcan's ..... 40@45%
Combination Pipe ..... 55@60%
Prentiss ..... 20@25%
Sargent's 40%
Smith & Hemenway Co.:
Machinists 40%
Jewelers 33⅓%
Snediker's X. L. 33⅓%
Stephens' 33⅓%

Saw Filers'—
Bonney's, No. 1, $13; No. 3, $16 .... 40%
Disston's D 3 Clamp and Guide, ₱ doz. $30 ..... 25%
Perfection Saw Clamps, ₱ doz. $8.00
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 ..... 45&50%

Wood Workers'—
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—
Bignall & Keeler Combination Pipe Vise 60%
Hollands' Combination Pipe .... 60@60&5%
Parker's Combination Pipe:
87 Series 60%
187 Series ..... 60&5%
No. 870 ..... 40%

Wads—Price Per M.

B. E., 11 up	*.60c*
B. E., 9 and 10	*.70c*
B. E., 8	*.80c*
B. E., 7	*.80c*
P. E., 11 up	*$1.00*
P. E., 9 and 10	*1.25*
P. E., 8	*1.50*
P. E., 7	*1.50*
Ely's B. E., 11 and larger	*$1.70@1.75*
Ely's P. E., 12 to 20	*$3.00@3.25*

Dis 15%

Ware Hollow—
Cast Iron, Hollow—
Stove Hollow Ware:
Enameled ..... 55c&10@60%
Ground ..... 60c&10@65%
Plain or Unground ..... 65c&10@70%
Country Holloware per 100 lbs., $2.50
White Enameled Ware:
Maslin Kettles 70%
Covered Ware:
Tinned and Turned 40%
Enameled 50%
See also *Pots Glue.*

Enameled—
Agate Nickel Steel Ware ..... 50&20
Agate Nickel Steel Ware, Specials ..... 60&15%
Iron Clad Ware ..... 70&10%
Lava, Enameled ..... 40&10%
Never Break Enameled 50%

Tea Kettles—
Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*.45c*	*.50c*	*.55c*	*.65c*

Steel Hollow Ware.
Avery Spiders & Griddles ..... 65@65&5%
Avery Kettles 60%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles ..... 65&5%
Never Break Kettles 60%
Solid Steel Spiders & Griddles ..... 65&5%
Solid Steel Kettles 60%

Warmers, Foot—
Pike Mfg. Co. Soapstone .... 40@40&10%

Washboards—
Solid Zinc: ₱ doz.
Crescent, family size, bent frame $3.00
Red Star, family size, stationary protector $3.00
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $2.65
Cable Cross, family size, stationary protector $2.90
Single Zinc Surface:
Naiad, familysize, open back perforated $2.40
Saginaw Globe, protector, family size, ventilated back $2.25
Brass Surface:
Brass King, Single Surface, open back $3.00
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.00

Washers—
Leather, Axle—
Solid ..... 80c&10@80c&10c&10%
Patent ..... 90c@90c&5%
Coil:

	⅞	1	1⅛	1¼ *Inch.*
	11c	*12c*	*13c*	*14c per box*

Iron or Steel—
Size bolt .... 5-16 ⅜ ½ ⅝ ¾
Washers $5.10 4.20 2.90 2.70 2.50
In lots less than one keg add ½c per lb., 5-lb. boxes add ½c to list.
Cast Washers—
Over ½ inch, barrel lots, per lb. ..... 1¾@2c

Waterers, Hog—
Improved Dewey, ₱ doz $13.00

Wedges—
Oil Finish ..... lb. 2.60@2.70c

Weights—
Hitching—
Covert's Saddlery Works ..... 60&10%
Sash—
Per ton, f.o.b. factory:
Eastern District $26.00
Western, Central and Southern Districts market unsettled, prices ranging from $21.00@25.00

Wheels, Well—
8-in., $1.60@1.80; 10-in., $2.00@2.25; 12-in., $2.45@2.65; 14-in., $4.00@4.25

Wire and Wire Goods—
Bright and Annealed:
6 to 9 ..... 72½&5@73½&10
10 to 18 ..... 72½&10@73½&10c&5%
19 to 26 ..... 75&10c&2½@75&10c&7½%
27 to 36 ..... 75&10c&7½@80&2½%
Galvanized:
6 to 18 ..... 70@70&5%
19 to 26 ..... 72½&5@72½&10%
27 to 36 ..... 72½&10@72½&10&5%
Coppered:
6 to 9 ..... 70&5@70&10%
10 to 18 ..... 70&10@70&10&5%
19 to 26 ..... 75&7½@75&10&2½%
27 to 36 ..... 75&10@75&10&5%
Tinned:
6 to 14 ..... 75@75&7½%
15 to 18 ..... 72½&5@75%
19 to 26 ..... 70&5@70&5&5%
27 to 36 ..... 70@70&5%
Tinned and Annealed on Spools ..... 70@70&10%
Brass & Copper on Spools 60@60&10%
Brass, list Feb. 26, '96 ..... 30%
Copper, list Feb. 26, '96 ..... 15%
Cast Steel Wire 50%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—
List June 24, 1903 ..... 90@90&10%

Wire Cloth and Netting—
Galvanized Wire Netting ..... 80&10@80&10&5%
Painted Screen Cloth, per 100 ft. $1.25
Standard Galv. Hardware Grade:
Nos. 2, 2½ and 3 Mesh, sq. ft. 3c
Nos. 4 and 5 Mesh, sq. ft. 3½c
No. 6 Mesh, sq. ft 3½c
No. 8 Mesh, sq. ft 4c

Wire Barb—See *Trade Report.*

Wrenches—
Agricultural ..... 80&5@80&10&5%
Baxter Pat'rn S Wrenches ..... 70&5@70&10%
Drop Forged S ..... 45@45&5%
Acme ..... 60&10%
Alligator 70%
Alligator Pattern 70%
Bull Dog 70%
Bemis & Call's:
Adjustable S ..... 35&5%
Adjustable S Pipe 40%
Brigg's Pattern ..... 30&10%
Combination Black ..... 40&5%
Combination Bright 40%
Merrick's Pattern 50%
No. 3 Pipe, Bright 55%
Boardman's 33⅓%
Coes' Genuine Knife Hdl. ..... 40&10&5&5%
Coes' Genuine Steel Hdl. ..... 40&10&5&5%
Coes' Genuine Key Model ..... 40&10&5&5%
Coes' "Mechanics' ..... 40&10&10&5&5%
Donohue's Engineer ..... 40&10%
Dudly Combination ..... 50&10&5%
Dudly Pipe ..... 50&10&5%
Dudly Adjustable Pipe ..... 40&10&5%
Eagle ..... 50&5&10%
Elgin Wrenches 40%
Elgin Monkey Wrench Pipe Jaws 33⅓%
Gem Pocket 30%
Hercules 70%
W. & B. Machinist:
Case lots ..... 50&5%
Less than case lots 50%
Improved Pipe (W. & B.) 60%
Solid Handles, P.S. & W ..... 50@50&5%
Stillson 65%
Triumph ..... 60&10%
Vulcan Chain 50%

Fruit Jar—
T & B Fruit Jar Wrenches ..... ₱ gro $9.00
Triumph Fruit Can Wrenches, ₱ gro $9.00
Triumph Fruit Jar Holders ₱ gro. $15.00

Wrought Goods—
Staples, Hooks, &c., list March 17 '92 ..... 90@90&5%

Yokes Neck—
Covert Saddlery Works, Trimmed 70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters' .. list net

Zinc—
Sheet ..... lb 6@6¼c

PAINTS, OILS AND COLORS.

White Lead, Zinc, &c.
Lead, English white, in Oil .. 8½@9¼
Lead, American White, in Oil:
Lots of 500 ℔ or over .. @ 6½
Lots less than 500 ℔ .. @ 7
In Barrels .. @ 6
Lead, White, in oil, 25 ℔ tin pails, add to ke price .. @ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price .. @ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price .. @ 1½
Lead, American, Terms: For lots 12 tons and over ½% rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice; for lots of less than 500 lbs. net.
Lead White, Dry in bbls .. @ 6
Zinc, American, dry .. ₱ ℔ 4½@ 4¾
Zinc, Paris, Red Seal, dry .. @ 8¾
Zinc, Paris, Green Seal, dry .. @ 9¼
Zinc, Antwerp Red Seal, dry .. @ 6¼
Zinc, Antwerp, Green Seal, dry .. @ 8¾
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over .. 12 @12¼
Lots of less than 1 ton .. 12¼@12¾
Zinc, V. M French, in Poppy Oil, Red Seal:
Lots of 1 ton and over .. 10¾@11¼
Lots of less than 1 ton .. 11@11½
Discounts.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots, one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.
Black, Carbon ..... ₱ ℔ 5 @10
Black, Drop, Amer ..... 4 @ 6
Black, Drop, Eng ..... 5 @15
Black, Ivory ..... 16 @20
Lamp, Com ..... 4½@ 6
Blue, Celestial ..... ₱ ℔ 4 @ 6
Blue, Chinese ..... 29 @32
Blue, Prussian ..... 27 @30
Blue, Ultramarine ..... 4½@15
Brown, Spanish ..... ½@ 1
Carmine, No. 40 ..... ₱ ℔ $3.50@3.75
Green, Chrome ordinary ..... 5½@ 6
Green, Chrome, pure ..... 17 @25
Lead, Red, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over .. @ 6½
Lots less than 500 ℔ .. @ 7
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over .. @ 6½
Lots less than 500 ℔ .. @ 7
Ocher, American ..... ₱ ton $8.50@16.00
Orcher, American Golden ..... 2½ @ 3
Orcher, French ..... 1½ @ 2½
Orcher, Foreign Golden ..... 3 @ 4
Orange Mineral, English .. ₱ ℔ 9 @11
Orange Mineral, French ..... 10¼@11½
Orange Mineral, German ..... 8¾@ 9
Orange Mineral, American .... 8 @ 8¾
Red, Indian, English ..... 4½@ 8½
Red, Indian, American ..... 3 @ 3½
Red, Turkey English ..... 4 @ 6
Red, Tuscan, English ..... 7 @10
Red, Venetian, Amer., ₱ 100 ℔ .. 50@1.50
Red Venetian, English, ₱ 100 ℔ .. 1.25@1 75
Sienna, Italian, Burnt and Powdered ..... ₱ ℔ 3 @ 6½
Sienna, Ital., Raw, Powd ..... 3 @ 6½
Sienna, American, Raw ..... 1½@ 2
Sienna, American, Burnt and Powdered ..... ₱ ℔ 1½@ 2
Talc, French ..... ₱ ℔ 1¾@ 2½
Talc, American ..... 75 @1.25
Terra Alba, French, ₱ 100 ℔ .. 95 @1.00
Terra Alba, English ..... 95 @1.00
Terra Alba, American No. 1 .... 65 @85
Terra Alba, American No. 2 .... 45 @50
Umber, Turkey, Bnt. & Pow. ₱ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer ..... 1½@ 2
Umber, Raw, Amer ..... 1½@ 2
Yellow, Chrome ..... 11 @14
Vermillion, American Lead ..... 10 @25
Vermillion, Quicksilver, bulk ... @70
Vermillion, Quicksilver, bags ... @71
Vermillion, English, Import .. 80 @85
Vermillion, Chinese ..... $0.90@1.00

Colors in Oil.
Black, Lampblack ..... 12 @14
Blue, Chinese ..... 36 @46
Blue, Prussian ..... 32 @36
Blue, Ultramarine ..... 13 @16
Brown, Vandyke ..... 11 @14
Green, Chrome ..... 10 @15
Green, Paris ..... @24
Sienna, Raw ..... 12 @15
Sienna, Burnt ..... 12 @15
Umber, Raw ..... 11 @14
Umber, Burnt ..... 11 @14

Miscellaneous.
Barytes, White Foreign, ₱ ton $17.50@20.00
Barytes Amer. floated ..... 18.50@20.00
Barytes, Crude, No. 1 ..... 10.00@11.00
Chalk, in bulk ..... ₱ ton 3.15@ ....
Chalk, in bbls ..... ₱ 100 ℔ .. @ 35
China Clay, English .. ₱ ton 11.00@17.00
Cobalt, Oxide ..... ₱ 100 ℔ 2.50@ ....
Whiting, Common .. ₱ 100 ℔ .45@ .48
Whiting, Gilders ..... .55@ .57
Whiting, extra Gilders' .... .58@ .60

Putty.
In bladders ..... 1¾@2¼
In bulk ..... 1¼@2
In cans 1 ℔ to 5 ℔ ..... 2½@4¼
In cans 12½ ℔ to 25 ℔ ..... 1½@2¼

Spirits Turpentine.
In Oil bbls ..... 64 @64½
In machine bbls ..... 64½@65

Glue.
Cabinet ..... ₱ ℔ 11 @15
Common Bone ..... 6 @ 8
Extra White ..... 18 @24
Foot Stock, White ..... 11 @14
Foot Stock, Brown ..... 7 @10
German Hides ..... 12 @18
French ..... 10 @40
Irish ..... 13 @16
Low Grade ..... 8 @11
Medium White ..... 14 @17

Gum Shellac— Cts. per lb.
Bleached ..... 40 @42
Button ..... 45 @55
Diamond I ..... 63 @..
Fine Orange ..... 51 @56
A. C. Garnet ..... 44 @..
D. C ..... 80 @..
T. N ..... 48 @51
V. S. O ..... 61 @..

Animal, Fish and Vegetable Oils.
Linseed, City, raw ..... ₱ gal. 42 @43
Linseed, City, boiled ..... 44 @45
Linseed, State and West'n, raw 40 @41
Linseed, raw Calcutta seed ..... @66
Lard, Prime, Winter ..... 62 @63
Lard, Extra No. 1 ..... 52 @53
Lard, No. 2 ..... 38 @40
Cotton-seed, Crude, f.o.b mills. 30 @31
Cotton-seed, Summer Yellow, prime ..... 37½@38¾
Cotton-seed Summer Yellow, off grades ..... 36¼@37
Sperm, Crude ..... @55
Sperm, Natural Spring ..... 61 @62
Sperm, Bleached Spring ..... 63 @66
Sperm, Natural Winter ..... 65 @66
Sperm, Bleached Winter ..... 67 @68
Tallow, Prime ..... 48 @49
Whale, Crude ..... @..
Whale, Natural Winter ..... 46 @47
Whale Bleached Winter ..... 48 @49
Menhaden, Brown, Strained .. 31 @32
Menhaden, Light Strained .... 32 @33
Menhaden, Bleached Winter .. 34 @35
Menhaden, Ex Bleached Winter 36 @37
Cocoanut, Ceylon ..... 6 @ 6¼
Cocoanut, Cochin ..... 6¼@ 6½
Cod, Domestic ..... 39 @40
Cod, Newfoundland ..... 40 @41
Red Elaine ..... 44 @45
Red Saponified ..... ₱ ℔ 5½@ 5½
Olive, Italian, bbls ..... 48½@ 51
Neatsfoot prime ..... 51 @ ..
Palm, prime, Lagos ..... ₱ ℔ 6½@6¾

Mineral Oils.
Black, 20 gravity, 25@30 cold test ..... ₱ gal. 13 @14
Black, 29 gravity, 15 cold test. 14 @15
Black, Summer ..... 13 @14
Cylinder, light filtered ..... 20½@21½
Cylinder, dark filtered ..... 18½@19½
Paraffine, 903-907 gravity ..... 15 @15½
Paraffine, 903 gravity .. .. 14 @14½
Paraffine, 885 gravity ..... 11¾@12¾
Paraffine, red ..... 14 @15½
In small lots ½¢ advance.

CURRENT METAL PRICES.

FEBRUARY 3, 1904.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined Iron:	
1 to 1⅜ in. round and square	₩ lb. @1.80¢
1⅜ to 4 in. x ¾ to 1 in.	₩ lb. @2.00¢
1⅜ to 4 in. x ¼ to 5-16	₩ lb. @2.00¢
Rods—⅝ and 11-16 round and square	₩ lb. @2.00¢
Angles:	Cts ₩ lb.
3 in. x ¼ in. and larger	2.15¢
3 in. x 3-16 in. and ⅛ in.	2.40¢
1¼ to 2½ in. x ⅛ in.	2.05¢
1¼ to 2¾ in. x 3-16 in. and thicker	2.00¢
1 to 1¼ in. x 3-16 in.	2.05¢
1 to 1¼ x ⅜ in.	2.10¢
⅝ x ⅛ in.	2.25¢
¾ x ⅛ in.	2.35¢
⅝ x ¼ in.	3.15¢
½ x 3-32 in.	3.65¢
Tees:	
1 in.	2.55¢
1¼ in.	2.35¢
1½ to 2½ in.	2.25¢
3 in. and larger	2.40¢
Beams	2.35¢
Channels, 3 in. and larger	2.35¢
Bands—1¼ to 6 x 3-16 to No. 8	₩ lb. 2.30¢
"Burden's Best" iron, base price	₩ lb. 3.05¢
Burden's "H. B. & S." iron, base price	₩ lb. 2.85¢
"Ulster"	₩ lb. 3.10¢
Norway Bars	3.25@3.75¢
Norway Shapes	3.75@4.25¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	1.85¢
Toe Calk, Tire and Sleigh Shoe	2.00@2.50¢
Best Cast Steel, base price in small lots	7¢

Soft Steel Sheets—

¼ inch	2.30¢	No. 14	2.45¢
5-16 inch	2.30¢	No. 16	2.55¢
No. 8	2.30¢	No. 18	2.65¢
No. 10	2.35¢	No. 20	2.65¢
No. 12	2.40¢	No. 22	2.70¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel	R. G. Cleaned.
No. 14	₩ lb. 2.45	2.60¢
No. 16	₩ lb. 2.55	2.70¢
Nos. 18 to 21	₩ lb. 2.65	2.80¢
Nos. 22 to 24	₩ lb. 2.70	2.90¢
Nos. 25 and 26	₩ lb. 2.75	2.90¢
No. 27	₩ lb. 2.80	3.10¢
No. 28	₩ lb. 2.90	3.20¢

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ lb. 11¾@14¢
Patent Planished	₩ lb. A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16	₩ lb. 2.93¢
Nos. 18 to 20	₩ lb. 3.17¢
Nos. 22 to 24	₩ lb. 3.41¢
No. 26	₩ lb. 3.66¢
No. 27	₩ lb. 3.90¢
No. 28	₩ lb. 4.15¢
No. 30	₩ lb. 5.12¢

No. 20 and lighter, 36 inches wide, 25¢ higher.

Foreign Steel from Store—

Best Cast	₩ lb. 15¢
Extra Cast	₩ lb. 18@20¢
Swaged, Cast	₩ lb. 16¢
Best Double Shear	₩ lb. 15¢
Blister, 1st quality	₩ lb. 13¢
German Steel, Best	₩ lb. 10¢
2d quality	₩ lb. 9¢
3d quality	₩ lb. 8¢
Sheet Cast Steel, 1st quality	₩ lb. 15¢
2d quality	₩ lb. 14¢
3d quality	₩ lb. 12¢
R. Mushet's "Special"	₩ lb. 46¢
" " "Titanic"	₩ lb. 19¢
Hobson's Choice XX Extra Best	₩ lb. 35¢
Jessop Self Hardening	₩ lb. 45¢
Seamans' "Nelson" Steel	40¢
Hobson's "Soho" Special Self-Hardening	₩ lb. 43¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free.	Per ₩
Banca, Pigs	29 @29¼¢
Straits, Pigs	29 @29¼¢
Straits in Bars	29½@29¾¢

Tin Plates—

American Charcoal Plates.

Calland Grade:	
IC, 14 x 20	$6.50
IX, 14 x 20	8.00
Melyn Grade:	
IC, 14 x 20	6.25
IX, 14 x 20	7.50
Allaway Grade:	
IC, 14 x 20	5.25
IX, 14 x 20	6.35

American Coke Plates—Bessemer—

IC, 14 x 20 ....108 lb.	$4.40@4.45
IX, 14 x 20	$5.40@5.50

American Terne Plates—

IC, 20 x 28	$8.60
IX, 20 x 28	$10.60

Copper—

DUTY: Pig, Bar and Ingot and Old Copper free. Manufactured, 2½¢ ₩ lb.

Ingot—

Lake	13½@13¾¢
Casting	13¼@13⅝¢

Sheet and Bolt—

October 22, 1903. Net

Prices, in cents per pound.

Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, gold, sheet, 30 x 60 and heavier.	32 oz. to 64 oz. 25 to 90 lb.	24 oz. to 32 oz. 18⅞ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 12½ lb.	12 oz. and 13 oz. 9½ to 11 lb.	10 oz. and 11 oz. 7¾ to 9⅜ lb.	8 oz. and 9 oz. 6¼ to 7½ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	18	19	19	19	20	21	22	25	28
30	96	72	18	19	19	19	20	22	25	28	
30	.....	96	18	19	19	19	21	25			
36	72	.....	18	19	19	19	21	23	26	29	
36	96	72	18	19	19	19	21	25	28		
36	120	96	18	19	19	20	22				
36	.....	120	18	19	18	21					
48	72	.....	18	19	18	21	23	26	29		
48	96	72	18	19	18	22	24	27			
48	120	96	18	19	21	23	27				
48	.....	120	18	20	22	25					
60	72	.....	19	19	20	22	25	30			
60	96	72	18	19	21	23	26				
60	120	96	18	20	22	25					
60	.....	120	18	21	23	27					
72	96	.....	18	22	22	27					
72	120	96	18	21	24	29					
72	.....	120	19	22	27						
108	96	.....	19	22	25						
108	120	96	20	23	26						
108	...	120	21	24	28						
wider than 108	132	.....	22	25							
	.....	132	23	24							

Circles Segments and Pattern Sheets, 3¢ ₩ lb. advance over price of Sheet Copper required to cut them from Cold or Hard Rolled Copper. 14 oz. ₩ square foot and heavier, 1¢ ₩ lb. over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ lb. over the foregoing prices.

All Polished Copper, 20 in. wide and under, 1¢ ₩ lb. advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 in. wide, 2¢ ₩ lb. advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ lb. more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ lb.	33¢
12 oz. and up to 14 oz. to square foot, ₩ lb.	34¢
10 oz. and up to 12 oz., ₩ lb.	36¢
Lighter than 10 oz., ₩ lb.	39¢

Circles less than 8 in. diameter, 2¢ ₩ lb. additional

Circles over 18 in. diameter are not classed as Copper Bottoms.

Polished Copper Bottoms and Flats, 1¢ ₩ lb. extra.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.

List Feb. 20, 1901.

Nos.	0000 to 8	9 and 10		11 and 12
	Base	½¢		¼¢ ₩ lb. adv.
Nos.	13	14	15	16
	½¢	¾¢	1¢	1¼¢ ₩ lb. adv.
Nos.	17	18	19	20
	1¼¢	2¢	2¼¢	2¾¢ ₩ lb. adv.

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.

Nov. 2, 1903. Net. Outside Diameter.

Stubs' W. G.	B. & S. W. G.	⅛	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	3-9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	18
12	10	.....	.....	.....	.....	.....	.....	24	24	23	23	18	18
13	11	.....	.....	.....	.....	.....	.....	25	25	23	23	18	18
14	12	.....	.....	.....	.....	25	25	25	23	23	23	19	19
15	13	.....	.....	26	26	25	25	25	23	23	23	19	19
16	14	.....	.....	26	26	25	25	25	23	23	23	20	20
17	15	.....	26	26	26	25	25	25	23	23	23	21	21
18	16	49	31	27	27	26	26	26	24	24	24	22	22
19	17	58	31	27	27	26	26	26	24	24	24	23	23
20	18-19	58	31	27	27	26	26	26	24	24	24	24	24
21	20	62	47	29	28	28	26	25	25	25	25	25	25
22	21	67	52	31	31	29	29	27	26	26	26	26	26
23	22	7	57	33	33	31	31	29	29	29	29	29	29
24	23	77	62	47	44	42	41	42	39	37	36	36	37
25	24	82	67	52	47	45	43	42	41	40	40	41	42

Copper Bronze and Gilding Tube, 3¢ ₩ lb. additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
30	32	30	27	21	21	21	21	21	21	21	23	23	25	27	28¢ ₩ lb.

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb. additional.

Brazed Brass Tubing.

(*To No. 19, inclusive.*) June 6, 1898.

Brown & Sharpe's gauge standard.

	Per lb.
Plain Round Tube, ¾ in. up to 2 in.	$0.35
" " ⅝ " ¾ "	.36
" " ½ " ⅝ "	.38
" " ⅜ " ½ "	.41
" " 5-16 " ⅜ "	.48
" " ¼ " 5-16"	.65
" " ⅛ " 3-16"	1.00
Smaller than ¼ inch	Special
2 inch to 3 inch, to No. 19, inclusive	.38
3 inch	.40
Over 3 inch to 3½ inch, inclusive	.45
Over 3½ inch	.50

Bronze and Copper, advance on Brass List, 3 cents.

Discount from list 5 %. 25%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Wider than	2	12	14	16	18	20	22	24		
and including	12	14	16	18	20	22	24	26		
To No. 20 inclusive	.22	.23	.25	.27	.29	.31	.33	.36		
Nos. 21 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37		
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38		
Nos. 27 and 28	.25	.25	.28	.30	.32	.34	.36	.39		
Common High Brass	in.	in.	in.	in.	in.	in.	in.	in.		
Wider than	26	28	30	32	34	36	38	40		
and including	28	30	32	34	36	38	40			
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*		
Nos. 21, 22, 23 and 24	.40	.43	.47	.51	.56	.61	.68			
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71			
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75			

* Special prices not less than 80 cents.

Add 1¢ ₩ lb. additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List 25%

Wire in Coils. List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gilding bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 25%; Copper Wire, NET. List November 16, 96.

Spring Wire, 2¢ ₩ lb. advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ lb., net 18¢

Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ lb. net, 19¢

Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb.

Western Spelter 5¾@6¢

Zinc.

Duty: Sheet, 2¢ ₩ lb.

No. 9, base, casks, 6½@6¾¢ | Open, per lb. 7@7¼¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 3½¢ ₩ lb.

American Pig	4¾@5¢
Bar	5¾@6¢
Pipe	₩ lb. 4¾@5¢
Tin Lined Pipe	₩ lb. 12¢
Block Tin Pipe	₩ lb. 40¢
Sheet Lead	₩ lb. 5¾@6¢
Old Lead in exchange, 4¢ ₩ lb.	

Solder.

¼ & ¼, guaranteed	19 @19½¢
No. 1	17 @17½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₩ lb.

Cookson	₩ lb. 8¼@8¾¢
Hallett's	₩ lb. 7 @7½¢

Aluminum—

Duty: Crude, 8¢ ₩ lb., Plates, Sheets, Bars and Rods, 13¢ ₩ lb.

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:	
Small lots	₩ lb. 37¢
100-lb lots	₩ lb. 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:	
Small lots	₩ lb. 34¢
100-lb lots	₩ lb. 33¢

Aluminum Sheet, B. & S. gauge, 50 lb or more

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₩ lb.	₩ lb.	₩ lb.
Nos. 13 to 19	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.56
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 lb 5¢ ₩ lb extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₩ lb 40¢	No. 15	₩ lb 43¢
No. 9 to No. 10	₩ lb 40½¢	No. 17	₩ lb 50¢
No. 11	₩ lb 41¢	No. 18	₩ lb 55¢
No. 12	₩ lb 41½¢	No. 19	₩ lb 60¢
No. 13	₩ lb 42¢	No. 20	₩ lb 65¢
No 14	₩ lb 44½¢	No. 21	₩ lb 80¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ lb 11¢
Light and Tinned Copper	₩ lb 10½¢
Heavy Brass	₩ lb 7¼¢
Light Brass	₩ lb 5¼¢
Lead	₩ lb 4¢
Tea Lead	₩ lb 3½¢
Zinc	₩ lb 4¢
No. 1 Pewter	₩ lb 17½¢
No. 2 Pewter	₩ lb 8¢
Pure Aluminum, Sheet, ₩ lb	21¢
Cast Aluminum, ₩ lb	16¢
Tin Plate scrap	₩ ton $4.50@5.00
Wrought Scrap Iron	₩ gross ton $11.50@12.00
Heavy Cast Scrap	₩ gross ton $10.50@11.00
Stove Plate Scrap	₩ gross ton $8.50@9.00
Burnt Iron	₩ gross ton $5.50@6.00